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THE DWARF COCONUT.

By Will. P. Handover.

THE increasing rise in the price of copra having given renewed activity to coconut planting in this country it is important that some facts of this interesting variety of coconut should be put on record.

Description.—The dwarf coconut known in this country as "nyiur gading" is remarkable for its early fruiting, palms only 10 feet high bearing abundant fruits touching the ground. The young palm grown under good conditions starts to flower in its third year and produces ripe fruit in about nine months from the appearance of the flower spike. The initial flower spikes contain only male flowers, but other spikes occurring in rapid succession, are larger and bear an increasing number of *female* flowers also, a spike from a six-year-old tree being counted with 200 young *female* flowers, whilst trusses of fruit from similar trees have been found with as many as 55 ripe nuts.

The dwarf coconut is generally of a bright yellow colour and Winstedt in his quotations from *Malayan Folk Lore* speaks of "'nyiur gading,' the golden coconut only to be found in princes' gardens."

There is besides, a distinct brick-red variety, also a green variety, and a number of intermediate colours which might be ranged as ivory yellow (hence "gading"), golden yellow, orange, brick red, green bronze, and deep green. The flower spikes, leaf bases, and leaf ribs, correspond in colour with the fruit, giving the compact trees a very handsome appearance. Again there are semi-tall trees of these different colours, which are later coming into bearing, have slightly larger nuts, and are less prolific than the true dwarf.

The dwarf yellow strain appears as the most prolific whilst the other varieties vary proportionately in their productiveness and also in the shape and size of the nut and are evidently the outcome of cross fertilization from original types or "mutants."

The different varieties are distinguished amongst the Malays and Javanese under particular names, such as *nyiur* (*klapa*) *gading*, *k. merah* (or *rajah*), *k. kapak*, *k. pisang*, *k. puyok*, *k. babi*, *k. sepang* and *k. nipah*.

A full grown leaf of the "nyiur gading" measures only 12 feet from base to tip, whilst an average ripe nut $22\frac{1}{2}$ in. × 24 in. in circumference, and the palm stem 24 inches in girth, the nut has an average amount of fibre, a thin shell, and proportionately with the big nut, a good thickness of white kernel.

This "meat" is said by the Malays to be richer in oil and sweeter in taste than that of the big coconut and it is therefore very popular with them for domestic purposes.

History.—In spite of diligent enquiry it has not been possible for the writer to find out the definite origin of this dwarf nut, but it seems first to have occurred as a "sport" or "mutant" probably in *Java*. Trees, thirty years old or so, occur in different parts of the peninsula and many of these still bear abundantly.

In 1912, 500 acres were planted with these dwarf nuts at Sungei Nipah Estate, on the Coast between Port Dickson and Sepang Point and this is probably the only estate of dwarf coconuts in the world. The seed nuts for this, were obtained from trees, then about 12 years old, grown by the Malays on the "bendangs" of the Krian rice district, who are reported to have got their original seed, individually at a dollar each, from ships arriving at Penang probably from Java.

From reliable reports from India it appears that this dwarf form is practically unknown, either in Malabar, the Madras Presidency, or Ceylon, though isolated groups as that of the "king coconuts" at Mount Lavinia doubtless occur.

Scattered trees also occur throughout Java and Sumatra, but not in any quantity, seed for planting having been sent to all the places named, also to Manila, and to the northern and eastern States of the Malay Peninsula.

Growth.—Like all coconuts, this dwarf form appears to be exceedingly hardy, growing well either in white clay, red loam, or deep peat, in fact it seems to thrive in any situation where water is abundant, yet not stagnant, though it is evident that well drained alluvium suits it best.

In such a soil six-year-old palms have been counted with 234 nuts on (excluding ovules) and the trees average 80 nuts a year.

The only figures available are those from Sungei Nipah where, unfortunately, the young palms were allowed in the early days of the war to get choked by lallang during the third year, and although they have responded wonderfully to better treatment since, this set-back at so critical a period, will doubtless have its effect throughout the life of the trees. The Malays say "nyiur gadang suka perkawan" and palms near dwellings readily demonstrate how well it responds to good treatment.

Crop.—In the first year of production at Sungei Nipah the crop over 225 acres was 102,000 nuts whilst the second year it was 574,000 nuts and the third year it will probably be nearly a million; from which the writer considers an average yield for dwarf nuts may be predicted as follows:

At the end of 4th year	=	1st yielding year	=	10 nuts per tree.
5th „		2nd „		30 „
6th „		3rd „		60 „
7th „		4th „		80 „
8th „		5th „		100 „
9th „		6th „		120 nuts per tree in full bearing.

These estimates in face of yields from individual trees will appear conservative but there are many points which have to be considered when dealing with *average* yields, and no doubt under ideal conditions a much higher average could be obtained.

In making *copra*, it has been found that the nut from a young tree is smaller than that coming later, and its kernel likewise thinner, whilst of course on heavy yielding trees the nuts are a little below the average in size, but 500 nuts to a picul of copra is a general average, which would be decreased somewhat later as more even nuts with thicker "meat" were obtained. With the leaf length only 12 feet it was found convenient to plant the palms 24 ft. × 20 ft. which gave 90 to the acre, a number nearly double to that required when planting big palms.

It will be evident therefore that with this planting we should get, say, in the fifth year of planting 90 × 30 nuts = 2,700 nuts per acre = $\frac{27}{5}$ = $5\frac{2}{5}$ piculs copra per acre. Likewise, in the ninth year 90 × 120 = 10,800 nuts per acre = $\frac{108}{5}$ = $21\frac{3}{5}$ piculs copra per acre. Comparing this with the big coconut which does not produce till *after* its fifth year but might be estimated as giving in its ninth year 45 trees at 40 nuts = 1,800 nuts per acre $\frac{1800}{220}$ = 8 piculs of copra per acre. With the dwarf trees there is the great advantage of easy and rapid picking, and inspection for beetles and other pests, though of course in manufacture one has to handle almost $2\frac{1}{2}$ times the number of nuts per picul of copra, but this is not of so great consequence when working with newly devised methods and machinery, dealing with large quantities.

The profit per acre from five-year old dwarf coconuts to-day can even stand comparison with that of rubber, and the man who is planting to-day, has to consider markets five years a head and might do worse than place confidence in the dwarf coconuts.

PRELIMINARY REPORT ON EXPERIMENTS WITH WET RICE IN KRIAN.

By H. W. Jack.

KRIAN is the largest padi growing district in the Federated Malay States and comprises an area of some 56,000 acres of irrigated land, of which, roughly, 50,000 acres are annually planted with wet rice, most of the remainder of the irrigated area being unsuitable for the crop, chiefly owing to the peaty nature of the soil.

The annual padi crop in Krian fluctuates around 14,000,000 gantangs, with variations of between one and two million gantangs in either direction depending largely on the climatic conditions which mark each season. This crop gives an average yield per acre of, approximately, 280 gantangs or 1,700 lbs. per acre of clean unhusked rice, over the entire planted area though the best areas produce 4,000 lbs. in a good year, a yield which compares very favourably with that obtained in Spain (the world's heaviest producer of rice per acre) considering the cost of production and the absence of any form of intensive cultivation or selection of seed.

The experiments embodied in this report have for their object the improvement of the padi crop from the point of view of yield of grain and they have now been in operation for four padi seasons. The first two seasons were normal with respect to climatic factors but ill-luck brought untimely floods during the harvest in the third season rendering that season's work of little definite use. The fourth season was marked by a series of uncontrollable disasters, late drought at sowing time, influenza epidemic at the planting period and heavy rains at harvest, which all combined to reduce the season's crop to, roughly, 60 per cent. of the normal average in most of the district and consequently made experimental results ineffective.

I.—Note on Cultural Methods in Krian.

Padi cultivation in the Federated Malay States as in other countries where modern equipment and enterprise have not been instrumental in developing the industry is carried out by the native in what, at first sight, appears to be a very primitive way. Nevertheless, the more their methods are examined the more evidence there is that, from the point of view of the physiology of the plant under cultivation, a high degree of perfection is attained.

The main experimental station in Krian is located at Titi Serong, some three miles from Parit Buntar and the land is designated as first class for padi cultivation. It is near the northern boundary of the area irrigated by the Government from a large catchment area (reservoir) wherein rain-water is impounded and from whence it is distributed to the fields by a system of canals and distributaries. At the beginning of the padi season water is run on to the land through these distributaries which issue from the main canal, until the land is flooded to a depth of about six inches. When the land is thus flooded the Malays begin the season by cutting down the luxuriant growth of grass and weeds, often exceeding five feet in height, resulting from four months of fallow after the previous harvest. The cutting is performed by means of an instrument called a "Tajak" which essentially consists of a heavy iron blade some eighteen inches

long and five inches wide at one end, tapering to one and a half inches wide at the narrow end where it is bent upwards almost perpendicularly to the blade and gradually narrowed to about five-eighths of an inch some two feet distant from the same, where it is inserted in a stout wooden handle. The "Tajak" is raised over the right shoulder and swung downwards so that the blade, its advancing edge being well sharpened, meets the stems of the grasses just at the level of the soil when it is travelling with its maximum velocity. The process is one of cutting and as the average weight of a "Tajak" is ten pounds the energy involved is apparently considerable yet, seven Malays standing in five to seven inches of water can finish an acre in a day of six hours. In the first instance only a small area of each man's land is cleared. In this he immediately prepares his nurseries and sows his seeds, the remainder of the land being prepared later at leisure or by contract if possible, but always in time to admit of leaving the cut materials to rot in the water for about a month before clearing it off and piling it up to construct "batas" or divisions between fields. In the construction of the nursery bed, the cut grass and weeds are piled up in a long strip, usually 3-4 feet in width until the pile stands about one inch above water level. On this green foundation sufficient mud is plastered to make the whole into a compact solid bed, on the top of which a thin layer of mud, rich in humus, is finally laid to complete the seed bed. Before the padi seed is sown it is usual to immerse it in water in an open basket so that all light and empty seeds which float off can be discarded. The good seed sinks and is left submerged in water for two days and two nights. Then it is withdrawn from the water but kept thoroughly moist for a further period of two days in order that germination may begin. In this germinating condition the seed is broadcasted thickly on the prepared nursery bed, the sowing usually being done in the cool of the evening. Three gantangs of seed are sufficient to plant up one acre of good land. After the seed has been sown it is customary to cover it with grass, banana or palm leaves in order to afford protection from birds while traps and lamps are used and poison laid, to lessen the depredations of rats which thrive abundantly in the padi fields. The young nursery is watered twice daily (morning and evening) and when the seedlings are 4-5 inches high the whole nursery is lowered by pulling out some of the supporting grass from underneath, until the surface of the bed is flush with the surface of the surrounding water. Lowering the nursery in this manner ensures its thorough wetness and thus eliminates all danger from the severest pest of padi seedlings, the mole-cricket (*Gryllotalpa borealis*) which, if the nursery soil is not saturated with water burrows into it, attacks and feeds on the tender rootlets, killing the plants. The mole-cricket abounds in the padi fields particularly at the sowing time and works so rapidly that its presence is rarely perceived until groups of seedlings are found dead. When the seedlings are about 10-12 inches high, that is, after they have been in the nursery about 12-16 days they are pulled up by their leaves in clumps of 150-200 with the nursery soil adhering to their roots and placed in the fields so that their stems stand in some two inches of water. This gives the individual plants more space tending to strengthen them while a rapid increase in height takes place and after an interval of about six days each of these clumps is divided into 5-6 smaller ones which are stuck into the soil of the padi fields to constitute the second transplantation. The plants remain

in this condition for about 20 days while vigorous and rapid growth continues until they are about 2½ feet high when the bunches are pulled out of the soil and sub-divided into small clumps of 12-20 plants each which are transplanted in rows so that each clump is allowed, roughly, two square feet. Thus there are affected no less than three transplantations. Final planting out takes place after a period of about 40 days from the last transplantation. The arduous work of planting is done almost entirely by women, who cleverly obviate as much as possible the necessity for stooping by the use of a simple instrument which they called "kuku kambing" (Malay for goat's hoof) and which consists of a strong iron rod, 12-15 inches long, inserted into a stout wooden handle, often of beautifully carved design. The free end of the rod is forked, the two prongs being placed at an angle of about 30° and being about an inch long. In final planting, the men assist the women folk to the extent of cutting the top 6-8 inches of leaf off the bunches of padi immediately prior to removing them from the soil they occupied after the last transplantation, excising the bunches from soil and finally subdividing them into quantities of such size as may conveniently be manipulated by the women planters. Each woman takes a bunch of plants in her left hand and with the right grasps her "kuku kambing" and also manipulates the number of plants to be planted in each "hill," usually 2-4, a number which depends on the vigour of the seedlings. Two or three of the plants are gripped just above their roots by the fork of the "kuku kambing" and then carried downwards in the fork and driven into the mud with sufficient force to enable them to maintain an upright position. Malay women are exceedingly apt at this work and plant the padi in fairly uniform rows with astounding rapidity, six women easily planting an acre in a day of five hours allowing, roughly, 1½-2 square feet for each "hill." Once the final planting of the padi is finished, the Malays do little or nothing towards nurturing the crop, except a little weeding, but the rapid growth of the padi gives weeds little chance in the fight for light and space. Fishing and philosophizing pass the cultivators' time between planting and harvest, a period of 3-4½ months, during which the magnificent vivid green of the padi fields changes to the white of flower and with coming maturity to the bright golden hue which prevails at harvest. The ripe grain is mainly cut by Tamil contract labour paid in gantangs of padi. The grain together with about two feet of straw is cut in handfuls with a sharp saw-edged sickle, the handfuls being laid on top of the stubble to dry. When dry the handfuls are gathered together into armfuls, bound loosely into sheaves and conveyed to a large open tub some four feet deep and wide, against the inside of which a ladder, having rounds about four inches apart is placed. The sheaves are beaten on the ladder, the shed grain falling to the bottom of the tub, whilst all scattered grain is retained by a high grass mat screen propped up against the tub in such a way, that all flying grains hitting against it, fall back into the tub. Scarcity of Tamil labour sometimes forces the Malays to cut the padi themselves. The Malay method consists in cutting each ear of padi separately by means of a peculiar knife called a "pisau menuai." This consists of a thin wooden cresent-shaped base, of which the length of the concave side is about one and half times the width of the hand and three times the breadth of the base. Into the middle of the convex side of this base a short sharp

blade is inserted and to the middle of the concave side and at right angles to it, is fixed at its middle point a piece of bamboo about four inches long. The base is slipped between the second and third fingers of the harvester, whose third and fourth fingers close tightly around one end of the bamboo crosspiece. The base of the ear to be cut is gripped between the thumb and first finger, while the second finger is used as a lever to press the straw of the padi against the blade. When about a dozen ears have been cut in this fashion held by the pressure of the first finger in the right hand, the bunch is then transferred to the left hand, while the right hand begins cutting a fresh bunch, to be transferred to the left as soon as it becomes inconveniently large to be retained easily in the right forefinger. When the increasing bunch in the left hand has become inconveniently large to hold, it is bound together by a straw and deposited on padi straw to dry. As in planting the Malay women show their extraordinary ability to handle this peculiar knife for twenty-one women can cut seven hundred gantangs of cleaned padi in a day. If the harvesting has been done by Malay women or by using the "pisau menuai," the bunches of padi ears are collected and precipitated on to a sheet of grass matting and the Malays, generally the men, tread on the bunches turning them over repeatedly with their feet in a rolling motion with consequent friction which separates the grains from the ears. Usually the padi is dried before thrashing it, irrespective of the method employed, though frequently the operation has to be done while the padi is in a wet condition. The process by which empty padi, dust and pieces of straw are separated from good grain is a simple and primitive one. A deep circular tray-shaped basket about three feet in diameter and of open half-inch mesh is suspended by strings from the point of contact of three stout bamboos forming a tripod some six feet high. The uncleaned padi is placed on this basket-sieve which is then rocked gently from side to side so that the padi falls through it in a slow stream. The operation is dependent on a steady breeze which, in the Krian padi fields, usually blows with clock-like regularity from noon to late in the evening almost daily throughout the year. The wind carries the dust, empty padi, etc., beyond the matting placed below the tripod to receive the clean padi which falls almost perpendicularly from the sieve. The good padi thus separated from the chaff is subjected to a further and final separation and cleaning by repeating the process just described after which the clean padi is measured into sacks in the presence of agents, who buy it for the Chinese millers.

II.—Variety Tests.

Nearly two hundred different varieties of padi have been collected in the Krian district, but the main bulk of the crop is derived from half a dozen varieties, of which the variety Seraup is the most important. Varieties of padi differ in shape, size and colour of grain, in the length of the maturation period, in yield per acre, in culinary and milling qualities, in chemical composition, etc., and tests of numerous varieties readily showed that the cultivators had selected really good varieties for the bulk of their crop. Besides testing many of the local padi varieties, a number of varieties from different parts of this country, and eight Siamese, nine Javanese and fourteen Indian varieties were tried, but so far, no introduced varieties have been found to approach those popularly used in Krian in yield of grain

per acre or in flavour. Different varieties of padi show distinct preference for different types of soil and for the padi growing conditions prevalent in Krian, the varieties already grown by the majority of the cultivators seem to be the most suitable and consequently all selection and other experimental work has been done with the best three of four local varieties. During the course of the varietal experiments a number (about 110) of pure strains of the better varieties were isolated and grown as pure lines in each successive season in order to maintain a fresh supply of seed. These pure strains will be used in hybridization experiments later on when storage accommodation is available and will also be of considerable use in forming a classification of padi varieties.

From the miller's aspect the different varieties of padi present considerable differences economically for it has been found that different varieties equally dried and similarly treated vary as much as 11 per cent. in weight for equal volumes. Likewise, the percentage of rice, calculated by volume, derived from different varieties of padi varies from 41-47 per cent. and calculated by weight, varies from 60-66 per cent.

The millers and cultivators are both aware of the above differences for the Malays mostly grow two kinds of padi in their bendangs, one for sale to the millers and the other for their own consumption and the millers show distinct preference for the heavier varieties of padi as long as the supply is abundant.

III.—Correlation Experiments.

In modern plant breeding the study of the botanical characters of plants has been given much consideration as affording an indication of a plant's capabilities or tendencies, for it has been found, that botanical characters are often definitely correlated with the breeding qualities of plants and thus they are reliable guides in selection work.

The study of the association of botanical and agricultural characters of plants has been developed in great detail and with marked success in recent years, notably in Sweden at the Svalof experiment station which has led the way in the study of present-day methods of plant selection. For instance, it was definitely ascertained that crisp and woolly hairs on the spikelets and flowers of barley were indicative of heavy yielding and commercially valuable types; and this is merely one of hundreds of similar examples with numerous groups of plants. Moreover, such slight differences in botanical characters prove constant in pure cultures, as do also their corresponding agricultural characters. In Krian, roughly, 100 different varieties of padi are being grown as pure lines and detailed descriptions of their botanical and agricultural characters are being recorded with a view to ascertaining their relationships. This work is not yet sufficiently advanced to permit of drawing final conclusions though indications show that it may prove most useful, particularly as an aid to selecting foundation stocks for initiating new and profitable races.

The following correlations have been worked out for padi in average soils in Krian.

(1) Correlation between the number of plants per hill and (*a*) tillering, (*b*) number of spikelets per panicle, and (*c*) yield.

In this experiment the variety Radin Puteh, a good yielding but light padi of six months maturation period, was used and all planting was spaced 15 by 18 inches.

TABLE I.

No. of plants per hill.	No. of tillers per hill; average of 100 holes.	No. of spikelets per panicle; average of 100 counts.	Yield per 100 hills; average of four duplications.	Average yield per hill from column 4.	Yield per acre in lbs.
			grms.	grms.	
1	13.3	10.8	5,465	54.6	2,800
2	14.5	10.8	5,175	51.7	2,650
3	15.5	10.6	5,580	55.1	2,820
4	17.1	10.5	5,290	52.1	2,710

From table I it is apparent that as the number of plants per hill is increased from one up to four, there is a fairly systematic increase in the number tillers per hill, but the number of spikelets per panicle tends to diminish, that is, the size of the ears shows a small decrease, so that, as the number of tillers increases, the average yield per tiller decreases. The yield per hill and per acre is not materially altered as the number of plants per hill is increased, within the limits of 1-4 plants, if 10 per cent. is allowed for the experimental error involved in cutting, threshing, cleaning and weighing the grain. This margin of error is none too high for it might easily be exceeded especially if weather conditions should be adverse, though in the experiment in question, the weather factor was eliminated as all operations subsequent to the cutting of the crop were performed in one day.

The average number of plants per hill in native planting in Krian is three when the seedlings are healthy, (more if they are weak) so that the Malays appear to have hit on a safe number in reckoning the amount of seed required per orlong (three gantangs for good land and as much as five to six in poor land).

It is quite evident that the splitting up of seedlings in transplanting nurseries stimulates general growth, and particularly tillering, to such a degree that a much smaller quantity of seed would be sufficient to plant up an orlong if only adequate precautions were taken to combat rats, which are highly destructive to the nurseries in this district.

Plants which in good land, have only been transplanted once, have produced under experimental conditions, roughly one-quarter of the number of tillers as that produced by plants transplanted and split up three times, all the energy of the former being used up in vegetation. In like manner, in similar land, the yield of grain varies directly, within limits, in proportion to the number of transplantations, the optimum number in Krian being four.

In poor land the reverse holds, for the soil is not nutritive enough to enable the plant to recover from the repeated shocks of several transplantations and a single transplantation is sufficient.

(2) The relation between the spacing of hills in planting and the number of tillers per plant.

In this experiment only one plant per hill was used in planting and table II shows the result obtained from three plots of different varieties, each variety duplicated twice.

TABLE II.

Spacing distance in inches.	No. of tillers per plant, average of 100 plants, two duplications.			Average of three varieties, two duplications.
	Variety Seraup.	Variety Radin Puteh.	Variety Padi Pahit.	
12 by 12	12.3	12.1	12.0	12.1
12 „ 15	16.0	15.2	14.9	15.4
15 „ 15	17.5	16.4	16.1	16.6
15 „ 18	18.4	17.4	17.3	17.7
18 „ 18	18.4	17.5	17.5	17.8

From table II it is evident that the number of tillers produced per plant varies directly according to the space allowed per plant, in planting out the padi into the fields, up to a certain limit. This limit is reached when the spacing is 18 by 18 inches, as any wider spacing permits weeds to grow too luxuriantly and too rapidly to the disadvantage of the padi and the padi planter, also the individual plant tends to produce too much vegetation. (Of course, in carrying out this and all other experiments, care was taken to avoid using any land within 20 feet of a batas, as near the batas, which is very rich in humus, the true tillering power of a plant is concealed by the rich nature of the soil which stimulates tillering and yield enormously as will be shown later.)

(3) The relation between the spacing of hills in planting and the yield per 100 plants and per acre.

This experiment was performed with two varieties and table III shows the averages of three duplications. Only one seedling was planted per hill. Yields refer to clean padi.

TABLE III.

Spacing distance in inches.	Yield per 100 plants in grms.		Yield per acre in lbs.	
	Variety Seraup.	Variety Padi Pahit.	Variety Seraup.	Variety Padi Pahit.
12 by 12	3,210	3,650	3,080	3,500
12 „ 15	3,970	4,740	3,050	3,650
15 „ 15	5,510	5,160	3,390	3,220
15 „ 18	5,760	5,390	2,950	2,770
18 „ 18	6,340	5,440	2,710	2,230

From the above figures it would appear that for heavy padi like Seraup (eight months) the best spacing distance is 15 by 15 and for lighter padi like Radin and Padi Pahit (six months) 12 by 15 inches.

However, these figures were obtained from padi plots grown under strict experimental conditions including fencing with small mesh wire netting in order to exclude rat attack, and the writer found that in practice, closely planted padi was much more liable to be damaged by rats than padi spaced more widely. Thus the heavy yields per acre shown by the variety Padi Pahit in the closer plantings, would very probably not have been obtained from unprotected plots or from a large area. In practice the Malays plant their padi, 17 by 15 inches in first class land (the average to the nearest inch, from many measurements). Near the batas this spacing does not seem sufficiently wide for the vigorous growth of the plants, whereas at the centre of the bendangs it seems to give a considerable excess of space to their stools. The average planting distance of Malay planting seems to be a convenient distance to suit both situations in the fields whereas heavier yields would doubtless be obtained if closer planting was adopted for padi in the middle of the bendangs where the soil is never as rich in humus as it is near the batas. The most casual observer can see that the padi grown near the batas produces a heavier crop than is produced by padi standing in the middle of the bendangs. Experimentally, when planting follows the Malay habit, it has been found that on the average, an acre of padi cut so that none of it is more than 20 feet distant from a batas produces 1.7 times as much grain as an acre of padi cut so that none of it lies within 20 feet of a batas. The high productive power of soil situated close to the batas is, of course, entirely due the richness of the soil in humus, which is derived from the decay of the vegetation used in constructing the batas. This would seem to indicate the advisability of dividing padi fields by batas not more than 50 feet apart, though such a division would render machine harvesting more difficult. The better alternative is green manuring which can be developed successfully in years of normal rainfall or even in abnormal years provided that the Irrigation Department can properly control the water in the padi fields.

(4) Relation between the weight of padi grain and its value as seed.

In order to carry out this experiment, 13 medium-sized ears of padi, representing three well-known and popular varieties, were selected. Each ear was labelled, each grain numbered and a diagram was made to show the position of each grain on its parent ear. Each numbered grain was then detached from its ear, weighed accurately and enclosed in a numbered bag to await sowing time. In this way over 2,000 grains were treated and later soaked in water for two days before being sown in nursery boxes. Each box contained 100 seeds in rows of 10, the rows being two inches apart and the grains in each row separated by one inch. When the seedlings were 12 days old the nursery boxes were submerged so that two inches of water stood on the surface of the soil on each box. In planting out the seedlings into the padi fields each seedling was labelled and all seedlings were planted $1\frac{1}{2}$ by $1\frac{1}{2}$ feet apart and protected from rats by a high wire netting. At harvest, the foliage produced by each seedling was bound around by a piece of string and labelled, the padi was cut away from the straw, placed in a paper bag bearing the number of its mother grain and later thrashed, cleaned and weighed, while each bunch of straw was left uncut to dry for seven days after which it was severed from its roots at the soil surface and weighed.

Table IV shows the figures obtained from one ear of the variety Padi Pahit, and one of the variety Seraup which fairly well represent the average results obtained from all ears.

From table IV it is obvious that very light grains are useless and should be avoided in selecting seed as they usually are, for the Malays generally immerse their seed in water so that light or empty seeds float to the surface and are discarded.

Once the very light seeds are eliminated the remaining seeds show a like percentage of germination and apparently possess similar producing powers (allowing for experimental errors) as evidenced by the figures in column 5 of table IV. Theorizing from scientific principles this is the result that was expected, for the essence of modern plant breeding demands that every pure bred seed should have the same germinal capacity as its parent, regardless of size, provided that it is grown in a healthy environment and has ripened properly. (Mutations excepted.)

TABLE IV.

Group. Weight in grms.	Total No. of grains in group.	Total No. of grain in group to germinate.	Per cent. of total No. of grains.	(Average weight of crop per plant in grms.)	
				Grain.	Straw.
Ear 4: variety Padi Pahit.					
.0000	1	0	0	0	...
.0125	13	0	0	0	...
.0150	11	3	27	47	...
.0175	2	1	50	47	...
.0200	6	4	67	52	...
.0225	12	7	58	43	...
.0250	29	21	72	49	...
.0275	75	48	64	46	...
.0300	38	26	68	44	...
.0325	10	6	6	42	...
Ear 12: variety Seraup.					
.020	7	7	85	75.7	347
.021	5	3	60	67.8	340
.022	8	5	62	56.0	317
.023	23	16	70	97.5	369
.024	35	25	72	78.2	383
.025	36	24	67	80.0	329
.026	20	13	65	96.3	395
.027	12	7	58	85.7	402
.028	3	2	67	80.3	415

IV.—MANURES.

(*a*) *General manures.*—In Krian padi planting conditions are such that manures cannot be put on the land just prior to planting on account of the flooded condition of the padi fields at that time.

Manures might be tried with advantage if added to the land immediately after the padi harvest, preferably in conjunction with green manures but owing to stress of work at harvest time the author was unable to put this idea into operation after either of the two dry harvests experienced. However, manurial work was planned and carried out at Kuala Kangsar where some nine acres of suitable land were rented from native cultivators.

The experiments were designed to test the effects of the simpler manures on the growth of padi, from the point of view of yield of grain. The land is abundantly watered and is suitably situated with a view to demonstration, but unfortunately owing to the cultivation of rubber on all the adjacent hills and consequent clean clearing, floods in the rainy weather are frequent and destructive.

The land was divided up into 60 plots of about one-sixth acre in area. Culturally, all the plots used in the experiments were similarly treated. In preparing the land for the crop each plot was "tajakked" and ploughed once before the manure was distributed, ploughed a second time a fortnight after the application of the manure and then rolled repeatedly until the soil was in a suitable condition for planting. For all plots included in the trials, the same variety of padi was used in planting, and all plots were planted each season within a period of one week, so that weather conditions should be practically the same for each. Plots were manured in duplicate. At harvest each plot was divided into three or four sub-plots of one-fortieth acre each in area and as each plot was duplicated there were thus six or seven sub-plots on which the same manure was applied. All estimates of yield were based on the amount of clean padi produced on a standard plot of one-fortieth acre.

TABLE V.

Manure and rate per acre.		Total No. of subplots.	Average of all subplots.	Yield per acre.	Plots.
	cwts.		gtgs.	gtgs.	
Lime	10	5	13	520	13, 29
Basic slag	5	6	12½	500	5, 19
Superphos	5	6	12⅝	510	1, 28
Nitrolim	2	6	12½	500	2, 23
Oil cake	3	4	12¼	490	8, 22
Fish guano	5	6	10¼	410	6, 14
Pot. sulph.	3	5	14¾	590	12, 20
Am. sulph.	3	5	8½	340	4 (a), 47
,, at flowering... ...	3	2	8½	340	4 (b), 46
Wood ashes	5	8	12	480	9, 30
Cow dung	5	6	12	480	10, 26
Grass leaves	10	4	10¼	410	15, 40
,, and ashes each	5	6	11	440	3, 27
,, ,, lime each	5	8	11½	460	7, 17, 41
Sodium nitrate	3	6	12½	500	18, 21
,, ,, at flowering ...	3	5	10¼	410	36, 52
Perlis guano	5	4	9¼	370	51
Controls (no manure)		8	11	440	11, 25, 53
Extra controls (no rat protection) ...		10	7½	300	

The table (V) is a summary of the results (average of two seasons) obtained. These manurial trials were badly damaged by rats particularly in plots adjacent to native owned fields in which the Malays took no precautionary measures against them. While no final conclusions can be drawn from the above results as they only cover two season's work, the results show plainly, what the land is capable of producing and, should pressure to be brought to bear on the Malays so that they would all plant their padi similtaneously their bendangs should produce at least 450 gantangs of clean padi per acre in place of the present average of, roughly, 300 gantangs. Judging from the growth and appearance of the padi before it suffered from the depredations of rats and from the results at harvest the following manures should prove beneficial: (1) wood ashes and grass or cowdung, (2) green vegetation and lime, (3) cowdung, (4) potassium sulphate, (5) superphosphate. Lime also appears to benefit the land under trial though unfortunately it was applied to plots, one of which is better situated as regards water supply than most of the other plots and hence it is not quite a fair experimental test. The great advantage of green manuring (grasses, leaves, cowdung, etc.), and ashes was easily apparent from observation in the field, though in both seasons, plots on which these manures were applied suffered badly from rats and in consequence the yields were not quite as good as was expected. They are manures easily obtainable by the native cultivators and they ought to be encouraged to use them particularly in old bendangs.

(*b*) *Green manuring.*—In Krian the Malays by long experience thoroughly realize the importance of green manuring for it is automatically introduced into their habitual cultural methods in growing padi. Between the padi seasons the land is permitted to grow up in swamp grasses which in 4-5 months of fallow in good land, form a vegetative cover some 5-6 feet high. This green stuff as explained under Division I forms an excellent green manure and its amount and nature at the end of the fallow season is a pretty good indication of the value of land for padi growing.

Normally in Krian, there is a spell of dry weather from the middle of January to the end of March or middle of April during which the padi fields are drained off for the harvest and continue to dry up as long as the drought lasts. Once the land is properly dry which is usually just before harvest it becomes so hard that intercrops can only be sown with great difficulty and water is often unobtainable in sufficient quantities for use on a field scale at this time. Consequently, the writer adopted the method of sowing green manure seeds broadcast amongst the ripening padi about one month before harvest while the soil is still left soft and moist after the surface water has drained away. This method proved very satisfactory for green manure seeds readily germinated in the soil and the seedlings suffered little damage during the harvesting operations. In this way the following green manure crops were tried with varied success: (1) Sesbania aculeata, (2) Crotalaria juncea, (3) Phaesolus mungo (green), (4) Phaesolus mungo (black), (5) Lathyrus sativus, (6) Tephrosia purpurea, (7) Cicer arietum.

Of the above, in Krian the first (Sesbania) was by far the most successful for it developed rapidly, forming a green cover of some six feet in height in four months and seeded well. Phaesolus also

did fairly well but its growth was somewhat stunted. In the harder soils of Kuala Kangsar the second (Crotalaria) and third (Phaesolus) were the only crops which grew really well. Doubtless cultivation would have improved all the above green crops, but owing to stress of work during and following each harvest, in connection with breeding experiments, no time was devoted to green crops or to taking records of yield from plots which had been sown with green manures. During the last two seasons all green manure crops were drowned by flooding as the soil was completely submerged for some two months after each harvest.

The following green manure seeds were also tried but the crops failed: (1) Cajanus indicus, (2) Dolichos biflorus, (3) Dolichos lablab, (4) Cassia mimosoides.

V.—Catch Crops.

There is room for every considerable development of the padi fields in Krian by the introduction of catch crops and green manures, and much could be done to stimulate their cultivation by soliciting the co-operation of the Irrigation Department. In years of normal rainfall there are a number of crops which could be grown with success and even profit, but in years of excess rainfall or drought the assistance of the Irrigation Department is essential in order to drain off floods or moisten struggling crops respectively.

During the last two years much has been done by the Irrigation Department to facilitate the movement of water and by the end of another year or so the irrigation system will probably be able to deal effectively with the water supply from the point of view of growing crops between the padi seasons.

The following catch crops were grown with a fair degree of success in Krian. The land was ridged, the ridges being $1 \times 3 \times 66$ feet.

(1) *Ground nuts.*—Ten ridges were planted with this crop and gave a total yield of 109 katies of nuts when only one line of plants was grown at the top of each ridge, i.e., a yield at the rate of 3,200 lbs. per acre. Had a double line of plants been grown on each ridge this yield would probably have been almost doubled and weeding costs would have been greatly reduced.

The average weight of nuts produced per plant from 100 plants picked at random was .175 katies or equal to 3,310 lbs. per acre, assuming no plants died, and that there are 65 plants per batas.

(2) *Sweet potatoes.*—This crop was planted on 60 ridges which gave a total yield of 26.61 pikuls, that is a yielding rate of 12,980 lbs. per acre. No weeding was done with this crop. There were 3,136 plants which gave an average yield per plant of 1.13 lbs. This crop would have been much heavier had there been a little rain in place of the drought which prevailed during the entire growing period, resulting in a high percentage of small tubers.

(3) Egg plant, lady's fingers, cucumber, many gourds, all grow well and are frequently planted by Malays on batas near their houses but no records of yields were taken owing to theft of the crops.

(4) *Castor oil.*—This crop was grown very successfully on the batas of the padi fields, when seeds were dibbled in to a depth of 2-3 inches at distances of 4 feet apart and lightly covered. No other cultivation was given except to clear the weeds from the bases of the growing plants once in six weeks.

The seed was sown during the padi harvest in March and the crop was mature in August.

In estimating the crop the fruits were picked from 25 average plants which gave the following results:

No. of plants harvested	25
No. of spikes on 25 plants	270
Total No. of fruits from 25 plants ...	9,582
Average No. of fruits per plant	383.3
„ „ „ spike	35.5
„ „ seeds per plant	1,150
(Assuming each fruit to contain 3 seeds)	
Weight of 100 air dried seeds	14.4 grms.
Therefore average yield per plant ...	165.5 „
And yield per chain of batas	2,649.6 „
(Reckoning 16 plants to the chain)	
Greatest No. of spikes per plant	20
Lowest „ „	6

The seed obtained was found by experiment to produce 35 per cent. of oil by weight, when the method usually adopted by Tamils was employed. Therefore, yield of oil per chain of batas is 2 lbs. roughly.

Castor would appear to be a good crop to grow on the existing batas on the padi fields.

The labour involved in sowing and harvesting the crop is practically *nil* and clearing the batas of weeds periodically would tend to reduce rat trouble for rats breed chiefly and are most abundant in the batas during the non-padi season.

The only requirement necessary to stimulate the cultivation of this crop is the assurance of a market for the seed or oil or preferably the creation of co-operative societies to establish small mills at suitable centres for expressing the oil and to undertake the collection of seed and the sale of the oil.

VI.—Selection and the Control of Experimental Errors.

The basis of modern selective methods depends on the isolation of pure strains, the selection of the desired types, their multiplication as pure lines and testing them under field conditions before distributing them for general use. The objective in these experiments was the isolation and multiplication of heavy yielding types of padi, in order to increase the yield in the district, and work towards that end was commenced in season 1915-16. During the harvest of 1915, 400 single ears of padi representing three varieties were selected in the field from specially good yielding plants, one ear from each plant.

Each ear was weighed, measured, numbered and labelled and later sown in the nurseries which were thoroughly protected from the ravages of rats and birds by a closed covering of wire netting of half inch mesh. Heavy floods, while the seedlings were tender, destroyed or mixed the seedlings from some eighty ears, so that they had to be discarded. The remaining seedlings were saved with difficulty by raising the nurseries on to floating platforms (as the water was over two feet deep) and later transplanted twice before being finally planted out in the bendangs. All planting followed the ear-to-the-row method, that is, the seedlings from each ear were planted in a row so that the seedlings from the base of each ear were at one end of the row and the seedlings from the tip of the ear, at the other end of the row, the seedlings occupying intermediate positions retaining them approximately. Consequently, all planting was also of the one-plant-to-one-hill method. After final planting, each plant in each line was labelled with an index number painted on a zinc disc which was fastened to a two-foot stake cut from the bole of a "pinang tree" and placed upright beside the plant to which it referred.

The plants in each row were spaced 18 inches apart and a space of $2\frac{1}{2}$ feet was maintained between each row. In harvesting the crop the product of each plant in each row was cut separately and tied in a bunch, labelled, dried, weighed and stored. The striking features of the harvest were the absolute evenness of growth and uniformity of ripening of all the plants in each row and the average large size of ear produced (big ears were originally selected). From the results of the harvest, it was found that the productive capacity of every seed of any individual ear was practically the same, irrespective of its position on its parent ear. This result discountenances the Japanese method of taking the top third of padi ears for their seed, though in taking the top third of the ear thorough ripeness, a necessity for good seed, is assured.

The heaviest bunch (that is, the product of the heaviest yielding plant) in each row was selected for seed for season 1916-1917. Thus each lot of seed used in season 1916-1917, being the product of a single seed of known origin, constituted a pure strain. In this season since it was desired to test the yielding powers of some three hundred pure lines or strains, it became necessary to ascertain a reliable method of comparison. The ideal method is first to obtain data on the inevitable error involved under the experimental conditions and then to formulate a system of controls that will ensure control of the inevitable error to any required precision. In recent years considerable work has been done on this problem.

Hall (I) in 1909 brings evidence to show that it was not possible to attach significance to differences of less than 20 per cent. in single experiments and that the only satisfactory method of obtaining increased accuracy was to duplicate experiments.

Mercer and Hall (1911) (II) obtained individual plot records over a large number of small plots similarly treated with a view to detecting the nature of the inevitable error in field trials with mangels and wheat. The analysis of their records shows that the inevitable error decreases as within limits, the size of the individual plot is increased, such reduction becoming inappreciable when the size of the plot is increased above one-fortieth of an acre.

Surface and Pearl (III) in dealing with plots of different dispositions employed a method of calculating the most probable yield of each plot under experiment, by applying a correction factor, plus or minus, according as the calculated yield was above or below the main yield.

Harris (IV) attempted to control this factor by the use of correlation coefficients between the yields of small alternate plots and groups of adjacent plots.

Wood and Stratton (V) using what is known as the "probable error" explained the theoritical basis of the method of controls and showed its application to the interpretation of results of feeding trials with cattle. They showed that in a series of results which exhibit a smooth frequency curve it was possible to interpret accurately any one result relative to the mean. They evaluated the "probable error" of plots of various sizes by the method of least squares and by the differences from the mean, in sets of duplicate experiments and they found that the "probable error" of annuals for one-fortieth acre plots to be about 5 per cent. of the mean. They gave tables showing the number of duplications necessary for the detection of results of required precision and indicated the limits of practical accuracy. The elaborate mechanism for the detection and control of error with which the above papers deal is no less necessary for perennials than for annuals.

Bishop, Grantham and Knapp (VI) discussed the necessity for the collection of standard data as a basis for co-operative scientific field trials with hevea rubber. They showed that, unlike annual crops, experiments with hevea were beset with age, peculiar manipulation (tapping) factors, etc., which had a great significance in the results and how necessary it was to exercise caution in the direct application of preliminary results obtained over a short period, in the interpretation of final results.

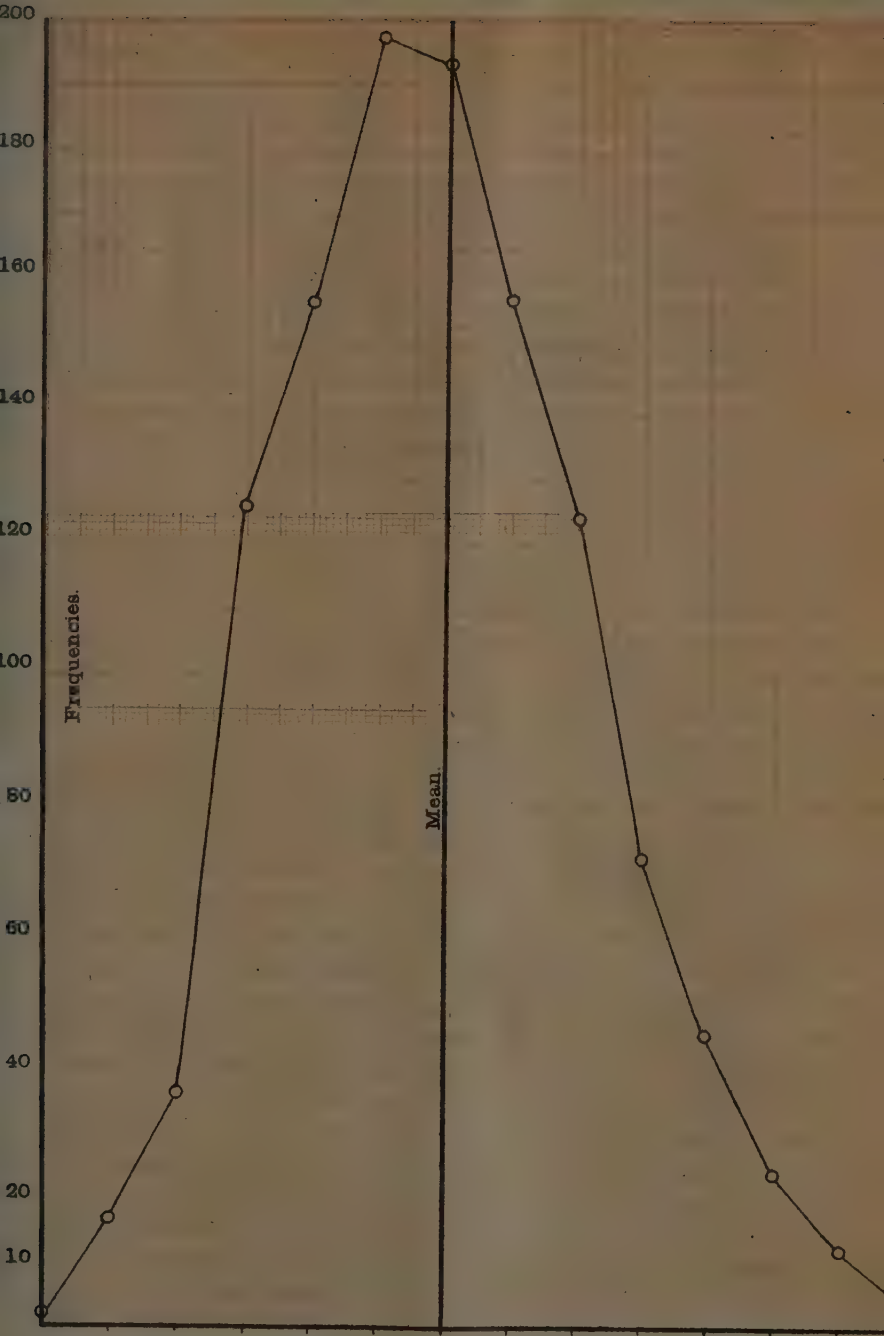
Cookson and Coombs (VII) have drawn attention to the peculiarly difficult nature of experiments with coconuts and have started work for the collection of preliminary data.

Bachelor and Reid (VIII) recently published the results of an exhaustive study in the individual effect of single trees in fruit trials.

The utilization of the evaluated "probable error" provides a means of controlling all errors. These latter fall into a variety of categories and include inherent variability of stock, soil, heterogeneity, manipulation errors, etc.

It is evident that in small trials individual plants belonging to strains of different productive capacities, will have a pronounced effect, but this can be controlled very largely by using "pure lines." The most disturbing factor in experimental work is that of soil heterogeneity. Pockets of soil, irregularity of sub-soil, local drainage effects, previous patchy cropping or unknown previous history all tend to an accumulation of errors.

In order to apply the "probable error" method of control to padi trials the following experiment was carried out to furnish the necessary data. One hundred and forty pure strains of a heavy yielding variety (Seraup) were carefully sown in nurseries which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Groups.

Curve No. I

were thoroughly protected from pests and so that all possibility of mixing the strains was eliminated. In planting out the seedlings into the padi fields, strings divided into eighteen inch intervals by knots of white tape, were stretched across the breadth of the fields and a single seedling was planted at each knot. The different strings were placed three feet apart, so that a space of three feet separated each line and a space of one and a half feet was maintained between each plant in each line. Each line of plants consisted entirely of seedlings of one strain so that the whole planting consisted of one hundred and forty pure lines of pedigreed seedlings. The number of plants in each line varied slightly according to the amount of seed of each strain used in the nursery. In the interval between planting and harvest daily precautions were taken against attacks of rats and stem-borers and the spaces between the lines were kept clean of weeds. At harvest each line of plants was counted off into successive plots of ten plants each and numbered. Each plot of ten plants was carefully cut in the Malay fashion, dried and placed in a labelled bag and all the bags of padi so obtained belonging to one line were tied together to await threshing, winnowing and weighing after the completion of harvest.

This experiment resulted in the compilation of data from 1,168 plots of ten plants each and the figures, (too voluminous to include here,) using the "percentage of the mean" method give "probable errors" of 8 per cent., 6 per cent., and 4 per cent. for plots of ten, twenty, and forty plants, respectively. Table VI shows the frequency tables for the different sized plots and curves I, II and III the frequency curves for the same.

Now, since the "probable error" of any number of results is the "probable error" of one result divided by the square root of the number of results (*see* reference No. V) therefore by two duplications, using plot of forty plants the "probable error" is reduced to $\pm$ 4 divided by $\sqrt{2} = \pm$ 3 per cent. approx.

In confirmation of the above experiment, 54 plots of one-fortieth acre each, were carefully measured in the middle of a field of padi at harvest and the crop from each plot was separately cut, threshed, cleaned and measured by volume (for figures, *see Agricultural Bulletin*, Vol. IV, No. 7, 1916), and from the data obtained and by using the alternative method known as the "square of the differences from the mean" a "probable error" of 5 per cent. was calculated. This error is higher than that obtained in the previous experiment because a further error was introduced in calculating from volume records as compared with weight records which were used in the former experiment. But for all practical purposes it seems sufficiently certain that in using two duplications of 40 plants each, the experimental error is well under 10 per cent.

Therefore it was decided to use plots of 40 plants and duplicate them twice in testing pure strains and to base calculations on an error of 10 per cent.

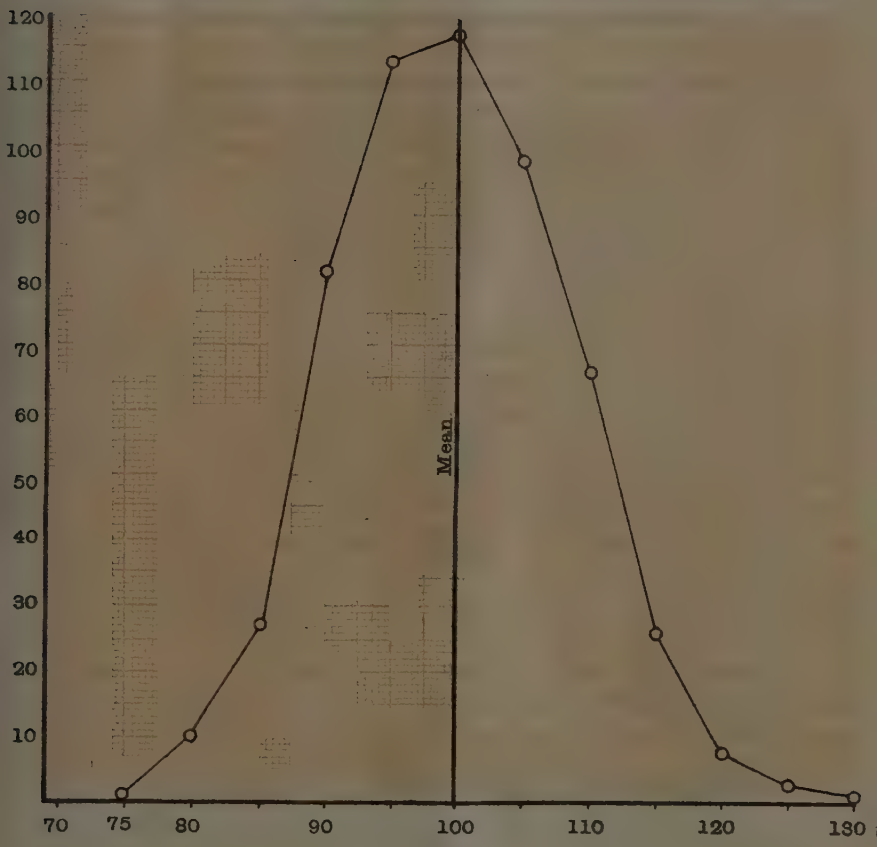
Consequently, in season 1917-18, some 300 pure strains were tested in this way, seed having been maintained pure and fresh in the intervening season. Unfortunately, just a few weeks prior to harvest, heavy rains fell incessantly, so that the padi was mostly

beaten down, some lines sustaining more damage than others and a good many lots were badly attacked by mould fungi owing to the impossibility of getting the cut padi dried rapidly. Some sixty lines were harvested before the rains set in, and from these frequency curve No. 4 was plotted. This curve shows that, roughly, half the number of strains harvested are of higher yielding capacity than the remainder and also that they are more productive than the average padi grown by the Malays of which the yield is indicated. The average yield of native cultivators' padi was carefully obtained by taking lines of forty plants in succession from the middle of native owned fields, cutting and weighing the cleaned grain. The mean indicated in the graph was obtained in this way (made up proportionally to 100 plants) and is the average result of 12 duplications.

The rains were so destructive that it was of little use relying on the results of this harvest so that seed of all the pure strains was preserved for the following season and at the same time realizing that the original selection was too small, the aid of the irrigation inspectors was solicited and thanks to them some 15,000 good ears of padi were obtained from all the best producing areas in Krian. These 15,000 good ears were graded and thoroughly examined and finally 1,000 of the best were selected for trial as pure lines in season 1918–19. These ears together with, roughly, 300 pure lines from the previous season, were sown in nurseries which were afforded the best possible protection against pests. The sowing was some seven weeks late owing to prolonged drought and consequent lack of water, but germination was good and sufficient seedlings of each lot were obtained to plant up two plots of 40 plants each. Again ill luck was experienced in the form of a very severe influenza epidemic which carried off so many coolies that the planting period was prolonged to about six weeks. This prolongation rendered half the seedlings too old to produce a good crop, as seedlings of more than 50 days from the last transplantation become so feeble that all their energy is used up in vegetation and little or no grain matures. In addition to the late drought at sowing time and to the influenza epidemic at planting, the late harvest also suffered from rain storms and flood.

The dry harvest weather was experienced before and during the padi flowering period, when the soil was dry and hardening but when the padi was ripe for harvest some eight inches of water covered the soil and the padi was badly beaten down in parts.

Consequently, it was impossible to rely on results obtained from such a damaged crop but from the 1,300 pure strains some 600 were rejected as being inferior to the rest, judging from their vegetative appearance at the flowering period. The remaining 700 strains were examined in the field and the grain from one plant of each strain was reserved for further trial next season. During the same season (1918-19) some 40 pure strains of probable high yielding capacity were tested in plots of one-fortieth acre each at six different centres in the Krian district. These also suffered very severely from drought, the "flue" epidemic and floods, but, nevertheless, two 6-month strains appeared to be especially good and these have been kept for trial again next season, as well as seventeen heavy yielding strains of padi Seraup (8-month), and 9 other promising strains of 6-month padi.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Mean
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Groups.

Curve No. II

TABLE VI.

The mean in each experiment, i.e., in any comparison of yields from plots in any "line" in 100.

Plots of 10 plants.			Plots of 20 plants.			Plots of 40 plants.		
1	2	3	4	5	6	7	8	9
Class.	Middle value.	Frequency.	Class.	Middle value.	Frequency.	Class.	Middle value.	Frequency.
68- 72	70	2	Same as columns 1 and 2.		0	81- 83	82	1
73- 77	75	17			1	84- 86	85	4
79- 82	80	36			10	87- 88	88	2
83- 87	85	126			27	90- 92	91	12
88- 92	90	157			81	93- 95	94	26
93- 97	95	198			114	96- 98	97	58
98-102	100	194			118	99-101	100	83
103-107	105	157			99	102-104	103	53
108-112	110	124			66	105-107	106	21
113-117	115	72			26	108-110	109	11
118-122	120	45			8	111-113	112	4
123-127	125	24			3	114-116	115	1
128-132	130	12			1			
133-137	135	4			0			
		536			233			102
		438			203			90

VII.—HYBRIDIZATION.

Modern investigations on heredity indicate that hybridization can only safely follow the insolation and testing of pure lines. Hence selection must precede hybridization or indeed any other form of experiment with rice (for native varieties of rice are exceedingly mixed) and for this reason a number of pure lines of different varieties have been kept under cultivation year by year as "foundation stocks" for future cross-breeding purposes (as mentioned in Division II of this report).

No hybrids have, as yet, been bred out, but a number of observations have been made as to the behaviour of the padi flower in pollination and the following hold good in every case for padi in Krian:

1. The flowers mature from above downwards.

2. A period of about eight days is necessary to ripen all the flowers on each panicle.

3. Flowers begin opening as the dew dries up and after 10.30 a.m. no more flowers open (except on cool dull days, which are of rare occurrence at flowering time).

4. Each flower only opens for a brief period of from 12-25 minutes in good weather.

5. The glumes open, the stamens hang out and the stigmas protrude once only.

6. While the flowers are fully open, the angle between the glumes is, roughly, 30 degrees.

7. The stamens emerge from the flower before the stigmas and pollination appears to take place both just before or at the opening of the glumes and just after the glumes have opened.

8. Flowers from which the anthers were cut immediately on the opening of the glumes set and developed good grain, so that they must have been already fertilised.

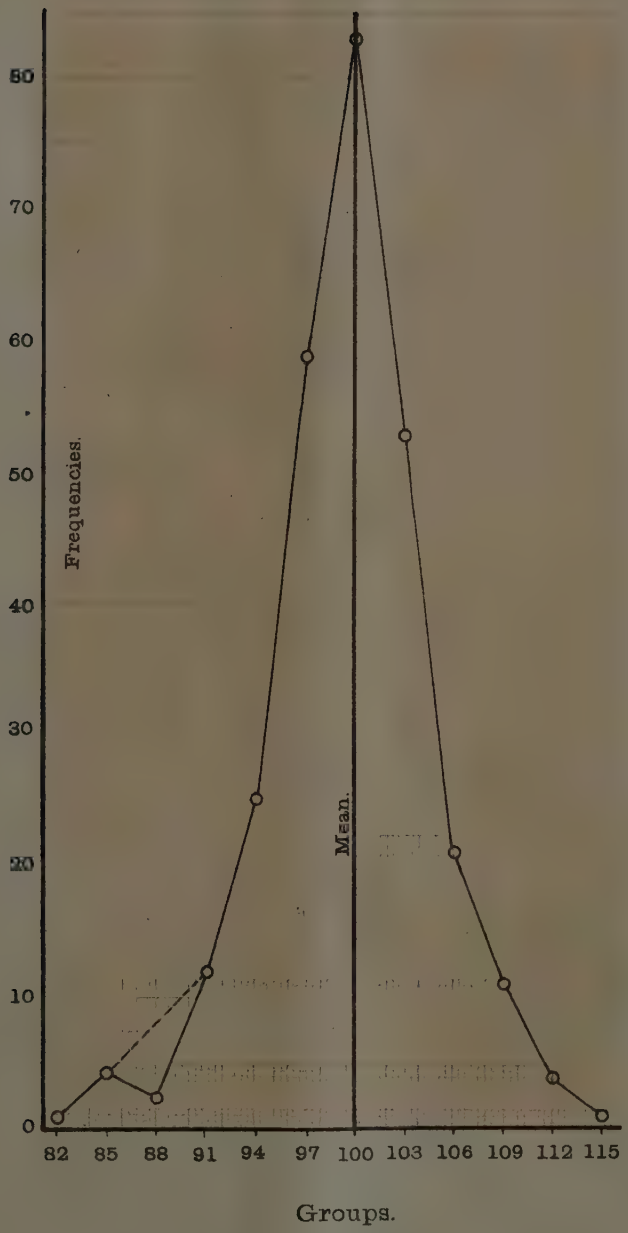
9. Flowers which were artificially opened to cut out the stamens, failed to set seed in 96 per cent. of the cases tried. This may be due to damage in opening the flowers which is a difficult operation owing to the stiffness of the glumes and brittleness of the stems.

10. Artificial cross-pollination is very difficult and only one artifically cross fertilized flower out of some 50 attempts gave mature seed.

VIII.—Diseases and Pests.

Normally, padi in Krian suffers little from pests or diseases, but under unfavourable weather conditions the crop is greatly diminished. Given suitable soil conditions the water supply is the all important factor in the healthy growth of wet padi particularly when the padi is young and tender. Water supply also chiefly controls the times of transplantation and seedlings left too long in nurseries are invariably found useless as grain producers. A constant supply of clean water (contaminated water is often detrimental of padi) is necessary up to the beginning of the flowering period of the padi after which drought hastens maturity, lightens the labour of harvesting and renders the process of harvesting much less wasteful. In Krian an excess of water weakens the plants, and any weakening factor tends to intensify the liability of the plants to succumb to pests.

In the nurseries the padi suffers mostly from floods and from depredations of rats, birds and mole-crickets but the Malays usually adopt practical precautions against them as described under "native methods." Floods frequently necessitate re-sowing of nurseries. Rats appear to travel in swarms of a hundred or more for six or eight days just after the grass in the fields has been cut and it is sometimes necessary, in consequence, to resow nurseries completely in areas of 40-50 acres. This rat swarming is more evident in seasons following a wet harvest, probably because of the more abundant food supply available to the rats during bad harvesting weather.


80
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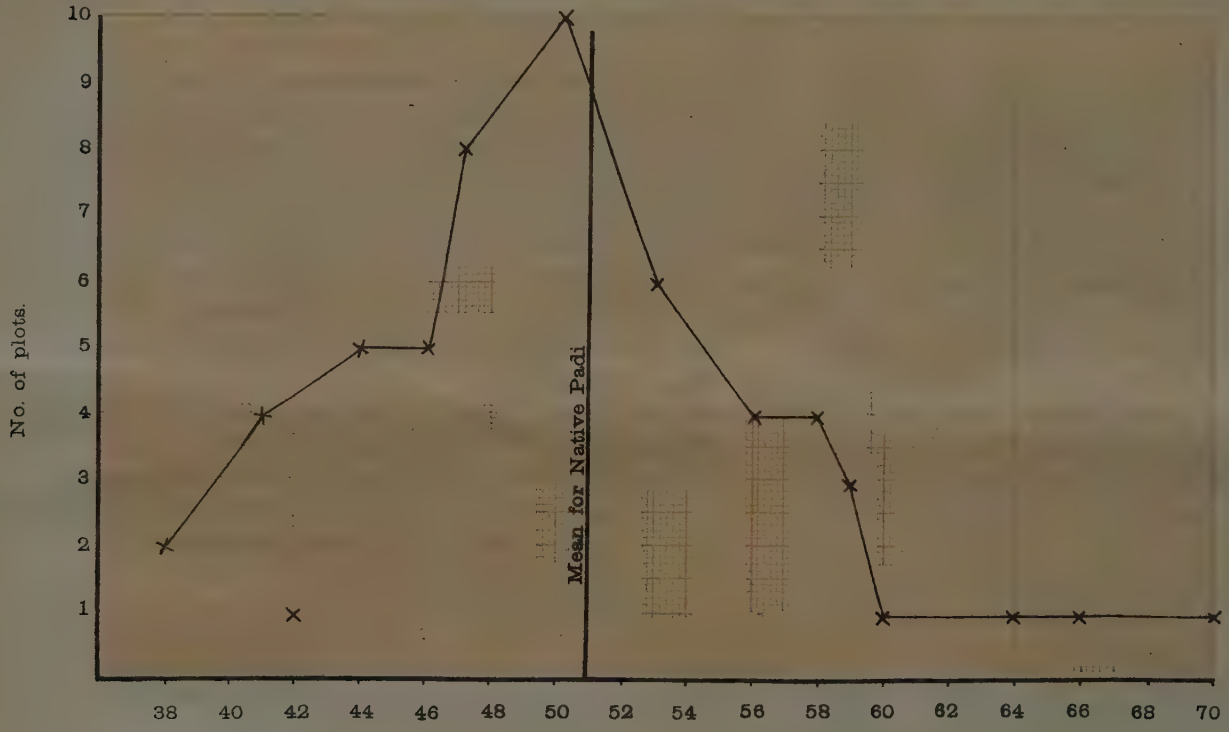
Frequencies.
Mean.
82 85 88 91 94 97 100 103 106 109 112 115
Groups.

Curve No. III

remembered that almost every form of industrial development has been the result of pure scientific research conducted by trained men whose motives were guided by their interest in scientific problems rather than by any hope of material gain. The use of pure strains of padi in all experimental work is most important. By the use of mixed seed the cultivators in Krian admit that their annual loss in harvesting must amount to 8-10 per cent. of their crops, for at the actual time of cutting the crop much grain is lost because of the uneven maturity of the different strains which compose a native crop. The grain of many plants may be found over-ripe and already scattered while many other plants may still be quite green and useless either as seed or for conversion into rice. The use of pure seed alone, even if only of average productive capacity, would by its absolute uniformity in ripening, ensure an increased annual production in Krian of at least 1,000,000 gantangs of padi, an amount sufficient to feed 7,000 natives for one year. In addition to the advantage of even ripening of pure seed the Malays appear to realize that the use of good seed means quick germination, regular growth, strong plants, and less weeding, for the experimental work created a demand for pure seed amongst local cultivators and the millers readily agree that pure seed benefits them in reducing the percentage of rice broken in milling.

Provided that water supply, with particular reference to drainage of the padi fields prior to harvest, can be thoroughly controlled (and the work of the Irrigation Department seems likely to effect this) the introduction of labour-saving devices and in particular of harvesting machinery, should offer wide scope for experiment. It is worthy of mention that on good land in Krian an average cultivator can plant up four or five times more padi than he could harvest and hence the necessity for employing rubber estate labour extensively each harvest season.

The use of harvesting machinery, if practicable, would lessen the loss of labour on the neighbouring estates during harvest and might encourage the cultivation of more padi per head of population. Machine reapers and binders have now been obtained and will be tried in the next harvest season. Other forms of machinery, ploughs, etc., might also be tried with advantage. The possibilities of the district from the point of view of the production of foodstuff other than rice in the "off" season are enormous, if only the natives can be persuaded to apply themselves more vigorously to agricultural pursuits. The most powerful form of persuasion with Malays is demonstration, which should prove most effective if practised on the lines of a scientifically managed model farm of some 30 acres in extent, but experiment must always preceed demonstration in order to ensure success. Padi work has been heavily hampered by the lack of facilities, particularly with reference to storage accommodation and trained assistants but these difficulties will disappear shortly with the completion of an office building now in course of erection and Malays are being trained as rapidly as possible in Kuala Lumpur. Only those who have had experience of padi work can realize the difficulties it involves, for not only does it demand a severe physical strain but the crop is exposed to so many uncontrolable factors, drought, flood, wind storms, birds, rats, etc., that experimental work is very largely dependant on chance and progress is necessarily slow.


No. of plots.
10
9
8
7
6
5
4
3
2
1
Mean for Native Padi
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
Yields in hundreds of grammes (to nearest 200 grms.) per 100 plants.

Curve. No. 4.

REFERENCES.

No. I.—Hall—"Experimental error in field trials." *Journal of the Board of Agriculture*, 1909.

„ II.—Hall and Mercer—"Experimental error in field trials." *Journal of Agricultural Science*, 1911.

„ III.—Surface and Pearl—"A method for correcting soil heterogeneity." *Journal of Agricultural Research*, Vol. 5, No. 22.

„ IV.—Harris—"Influence of substratum heterogeneity." *Science*, Vol. 5, No. 38.

„ V.—Wood and Straton—"Interpretation of experimental results." *Journal of Agricultural Science*, Vol. 3, 1908-1910.

„ VI.—Bishop, Grantham and Knapp—"Probable error in field experimentation with hevea." *Archief Voor is rubber cultur*, Vol. 1, No. 5, 1917.

„ VII.—Cookson and Coombs—"Observation on coconut experiment." *Agricultural Bulletin, F.M.S.*, Vol. 5, No. 10.

„ VIII.—Bachelor and Reid—"Relation of variability of yields of fruit trees to accuracy of fields trials." *Journal of Agricultural Research*, Vol. 12, No. 5.

METHODS AND MACHINERY FOR THE EXTRACTION OF OILS FROM SEEDS.

A CORRECTION.

With reference to the article by the writer contained in the *Agricultural Bulletin*, Vol. VII, No. 1, January-February, 1919, a letter has been received from Messrs. Manlove, Alliott & Co., Ltd., Colonial and General Engineers, Bloomsgrove Works, Nottingham, England, stating that the original makers of Oil Mill Machinery on the open or Anglo-American Press system were the firm of Messrs. James Whitham & Sons of Leeds, the Oil Mill Department of which firm was purchased subsequently by Messrs. Manlove, Alliott & Co. in 1885 when Messrs. James Whitham & Co. gave up their business. Since that date Messrs. Manlove, Alliott & Co. have continued and improved upon the original designs. The writer is pleased to accept this correction in regard to the Anglo-American system, which had been apparently erroneously attributed to another well-known oil machinery manufacturing firm.

B. J. E.

MEMORANDUM ON THE FIGURES OF MALAY POPULATION IN THE FEDERATED MALAY STATES IN RELATION TO PADI CULTIVATION.

By E. S. Hose

(*Director of Food Production, F.M.S. and S.S.*).

A GREAT deal has been said and written recently tending to suggest that the Malays of these States might reasonably be expected to make a much larger contribution towards our local needs by increased cultivation of padi, and hinting that if due pressure were brought to bear on this section of the community a solution would soon be found of the difficult problem of our rice supplies. It seems desirable, therefore, to investigate the position in the light of such data as are available.

The only reliable information as to population is to be found in the Census Report for 1911. The Malay population of the Federated Malay States at that date amounted to 208,399 males + 185,213 females = 393,612 persons. These figures include all persons of race kindred to Malays, but do not include the aboriginal tribes (Sakai, etc.) of the Peninsula. It is interesting to note in passing that Javanese and other races from various parts of the Dutch East Indies account for 33,047 males + 19,560 females = 52,607 persons out of this total.

An examination of the figures by age discloses the fact that 75,862 males + 73,135 females = 148,997 were under 15 years of age, while 21,114 males + 16,222 females = 37,336 were over 50. This leaves a Malay population of working age of 111,423 males + 95,856 females = 207,279 persons.

A reference to the tables of occupations in the report shows that 75,134 males + 106,185 females = 181,319 persons were returned as without employment. It will be seen that the children under 15 and the old people over 50 exceeded the number of unemployed persons by 5,148. The inference is, therefore, not unfair that the amount of unemployment amongst Malays was negligible, and this is further borne out by the exhaustive character of the tables of occupations. They are subdivided into no less than 113 separate descriptions of occupation, and it is significant that those described as of "independent means" amounted only to 192 males + 179 females = 371 persons, "beggars" amounted to 56 males + 3 females = 59 persons, and those maintained at State expense, such as pensioners, and inmates of hospitals and asylums totalled 241 males + 86 females = 327 persons.

The heading in the table of occupations that is of interest in connection with this enquiry is that of Agriculture, in which it is stated that 99,787 males + 65,640 females = 165,427 persons were employed. This heading is subdivided into 12 different descriptions

of occupation, and we find that padi land cultivators account for 52,803 males + 55,408 females = 108,211 persons. There are two other descriptions of occupation in which some padi planters may possibly be included, namely, "kampong holders," accounting for 13,617 males + 4,690 females = 18,307 persons and "planters, unspecified," accounting for 1,865 males + 543 females = 2,408 persons.

It is well known that there are a great many kampong holders, especially Javanese and foreign Malays, who have no padi land, but let us grant that half of the persons described as "kampong holders" and "planters unspecified" should be included in the category of padi planters.

It has recently been estimated by Mr. R. J. B. Clayton, and I believe that his estimate is generally accepted as fair and reasonable by those who are in a position to judge, that the average area that a Malay and his family may be expected to cultivate with rice is about three acres.

If every Malay male is regarded as the head of a family we have 59,543 families of padi planters in the Federated Malay States in 1911.

The area recorded as under padi cultivation in 1911 was 103,278 acres, but it was reported that considerable areas in Selangor and Negri Sembilan could not be cultivated owing to unfavourable weather conditions and consequent lack of water. It would, therefore, be fairer to take the figures for the following year, when 122,751 acres were reported as cultivated with padi.

If these last figures are compared with the number of Malay families whose occupation was padi planting, it will be seen that in 1912 the average area cultivated by a family was 2.06 acres as against a maximum capacity of three acres for each family; or expressed in another way 122,751 acres were actually cultivated as against a maximum capacity of 178,629 acres.

It is recorded in the 1911 Census Report that the increase in the Malay population during the preceding decennial period was 26.9 per cent. It may, therefore, be considered reasonable to add 25 per cent. to the Malay population of 1911 to arrive at approximate figures for the present year, and the same percentage may be added to the number of families of padi planters. This gives us 64,429 families of padi planters at the present time, with a maximum capacity of 193,287 acres.

The actual figures of padi cultivation in the season 1918-1919, as reported by Penghulus to District Officers were 153,622 acres. The figures for the present season (1919-1920) are not yet to hand, but they are known to be considerably higher than those of last season, and I shall be surprised if they fall far short of 180,000 acres. But even if we accept as low a figure as 165,000 acres, we find that each Malay family is planting on an average as much as $2\frac{1}{2}$ acres with padi, and that a maximum effort on their part would only result in an increase of less than 30,000 acres in the area cultivated.

In conclusion it is not without interest to compare the above figures of actual cultivation and possible maximum cultivation with the area that it would be necessary to cultivate in order to make the Federated Malay States self-supporting in the matter of rice.

The total population of the Federated Malay States in 1911 was 1,036,999 persons, and the rate of increase during the preceding decennial period was 52.8 per cent. We may, therefore, estimate the present population to be about 1,500,000.

It is considered that 50 gantangs of husked rice per head of population is a reasonable annual allowance for such a population as ours, that is to say 75,000,000 gantangs. Taking 100 gantangs of padi as being equal to 50 gantangs of husked rice, and 200 gantangs of padi as the average yield per acre throughout the Federated Malay States, we find that half an acre is required to be cultivated with padi for every head of population or 750,000 acres in all.

While I agree that the above facts and figures demonstrate the necessity for a sustained effort to increase local food production by all practicable means, I submit that they should dispose of the two-fold fallacy that the contribution made by Malays is far short of what might reasonably be expected and that a greater effort on their part would go far to alleviate the present situation.

NOTES ON THE PREPARATION OF A FOODSTUFF KNOWN AS "GAPLEK" FROM CASSAVA (TAPIOCA) ROOTS.

THE following information as to methods adopted in Java for the preparation of "Gaplek" from Cassava (tapioca) roots have been supplied by the courtesy of the Director of Commerce at Buitenzorg.

Great success has attended the use of "Gaplek" as a partial substitute for rice in the Netherlands East Indies.

The roots of the tapioca are first pared, and then split lengthwise into four parts, which are again cut into three or four pieces three, four or five inches long and one and half to two inches thick, according to the size of the roots.

These pieces are dried in a natural way, i.e., by exposing them for five or six days or longer, if necessary, to the sun, and as they contain a large percentage of water, the loss in weight is considerable. Three tons of fresh roots are necessary to obtain one ton of dried product (Gaplek).

When required for food the Gaplek must be converted into flour.

A gantang of Gaplek ($2\frac{1}{2}$ katies a day is sufficient for a family of five persons) is pounded in an ordinary rice mortar. The pulverised mass must then be winnowed to separate the flour from the coarse root fibres.

This flour can be used in the same way as pounded rice or maize.

For daily use as a foodstuff the flour is spread out in a tray, then kneaded with some water, and afterwards steamed in the same way as rice.

The cooked mass is somewhat granular and can be eaten in the same way as boiled rice, with or without vegetables or condiments.

If a certain amount of rice is available, but not sufficient to last till the next harvest, it is advisable, instead of finishing all the rice first and afterwards eating Gaplek, to mix rice and Gaplek flour in equal quantities daily. The rice must first be half steamed and then an equal quantity of Gaplek flour (kneaded with water) is added and mixed with the rice, and the mixture is then steamed until thoroughly cooked.

DEPARTMENTAL NOTE.

Information has been received from the Secretary of State for the Colonies that Mr. G. E. Coombs, Economic Botanist, F.M.S., has resigned his appointment as from 30th September, 1919.

INDIAN IMMIGRATION.

A SPECIAL meeting of the Indian Immigration Committee was held at Kuala Lumpur on 1st October.

There were present: The Acting Controller of Labour (Mr. E W. F. Gilman), Chairman, Director of Public Works (Mr. R. O. N. Anderson), Mr. F. G. Harvey, Hon'ble Mr. E. Macfadyen, Mr. J. Bruce, Dr. A. R. Wellington (Senior Health Officer, F.M.S.), and Dr. W. H. Fry (Chief Medical Officer, Penang) also attended.

The meeting was called to consider the advisability of stopping immigration from India on account of the threatened overcrowding of the quarantine stations through the continued introduction of cholera in infected ships. It was agreed that in view of the improvement in the situation, the last three steamers being uninfected, this step was not now necessary but having regard to the prospective demands for labour it was decided to recommend that considerable increases be provided to the quarantine accommodation at Penang and Port Swettenham.

MINUTES OF A MEETING OF THE ADVISORY COMMITTEE, DEPARTMENT OF AGRICULTURE.,

HELD AT THE OFFICES OF THE DEPARTMENT ON WEDNESDAY, THE 22ND OCTOBER, 1919, AT 10.30 A.M.

PRESENT:—Mr. L. Lewton-Brain (Director of Agriculture) Chairman, Messrs. F. G. Harvey, Shelton-Agar, W. S. Cookson, J. Bruce, C. Bell, J. S. Ferguson, Lee Kong Lam, Chew Kam Chuan and Mr. F. G. Spring (Agriculturist) Secretary.

ABSENT:—Messrs. J. W. Kennedy, R. H. Phillips and H. C. D. Arcy-Irvine.

Mr. E. S. Hose (Director of Food Production) and Messrs. B. J. Eaton and A. G. G. Ellis attend the meeting.

The minutes of the previous meeting held on the 23rd July, 1919, having been circulated are taken as read and confirmed.

QUARTERLY PROGRESS REPORTS.

The quarterly progress reports of officers of the Department are laid on the table and the Chairman invites discussion.

Mr. COOKSON considers the report of the Acting Mycologist is somewhat short and lacking in detail. The Chairman replies that such detail is brought before the Brown Bast Committee. At the suggestion of Mr. Cookson it is agreed to write to the Secretary of the Brown Bast Committee and ask that this committee may be kept informed of the progress of work.

SELANGOR LARGE-SCALE FARM.

The CHAIRMAN informs the meeting that an area of 2,500 acres have been reserved for a Selangor large-scale farm and that the land is at present being demarcated. The question of a manager is considered. The Chairman mentions that Mr. Corbetta will shortly be returning to the Federated Malay States, and that he considers him a suitable candidate for the post. It is agreed that Mr. Corbetta would be a suitable manager.

STOCK FARM.

The CHAIRMAN informs the meeting that the establishing of a stock farm had received the approval of the Secretary of State and further that the appointment of Mr. A. G. G. Ellis as Superintendent of the farm has also been approved.

The CHAIRMAN refers to Kroh as a possible site but in view of the suggestion that the farm be run in conjunction with an experimental area sufficiently large to test the possibilities of growing dry-land padi on a commercial basis with up-to-date machinery it was considered advisable to procure more suitable land. In this connection the Director of Food Production, Mr. Hose, Mr. Ellis

and Mr. Spring inspected an area known as the Gali plain near Raub and the Chairman asks Mr. Ellis to give the meeting a clear outline of the prospects of this area as compared with that of Kroh. Mr. Ellis explains that a combination of a stock farm and an area for testing dry-land padi could be efficiently and economically run and that what is now required is a tract of land suitable for cultivation.

Mr. ELLIS referred to Kroh as being totally unsuitable for the combined scheme in so far that food production could not be developed there, and further in some respects it is not an ideal locality for stock raising on account of its proximity to other States, with the consequent possibilities of the introduction of disease. On the other hand, the Gali plain is admirably suited for dry-land padi cultivation. He mentions that the Gali plain is situated on the main trunk road four miles from Raub and thirty-five miles from Kuala Lipis. The Gali plain itself contains, approximately, 1,200 acres, part of which is already under wet padi to the extent of about 150 acres, of which only a small proportion has been actually alienated. The plain is flat, well watered and can be easily drained. The soil is a sandy clay. The greater part of this area is under grass and lalang, the remainder being under blukar. An adjacent area of, approximately, 200 acres is under grass and is suitable for grazing purposes.

It is satisfactory that there is a low ridge bordering the plain suitable as a site for the majority of the required buildings. In the immediate vicinity there is a limestone mountain (Bukit Serdang) surrounded by considerable areas of flat and undulating land under heavy jungle. It might be possible to arrange that the limestone and timber referred to should be utilized by a company for the production of acetic acid and other substances obtained from the destructive distillation of wood and if so a very great saving could be effected as regards clearing of timber in the event of a further development of the farm area.

Mr. COOKSON refers to the lower temperature of Kroh and asks whether this factor is not of first consideration.

Mr. ELLIS while agreeing on this one point remarks that there are so many other factors to be taken into account which more than outweigh the question of elevation. In the first place the suitable blocks at Kroh are scattered and in consequence could be less economically run than a compact area such as the Gali plain. Further the stock is more likely to keep healthy at Gali than at Kroh.

Mr. SHELTON-AGAR asks whether it is proposed to endeavour to improve the existing pasture or to introduce new varieties of grasses.

Mr. ELLIS replies that both methods would be experimented with. It is mentioned that a provision of $100,000 is included in this year's Perak Estimates for buildings, roads, drains, etc.

Mr. HOSE informs the meeting that the large-scale production of dry-land padi can be more effectively undertaken than the production of wet padi. In the first place wet padi demands a large resident labour force and there is not the population, at any rate in the near future, to tackle such a scheme.

Dry or tenggala padi has the advantage of requiring less labour as the padi area would be worked by machinery.

Mr. Hose favours the Gali plain as the opening up charges there would be little as compared with land under jungle conditions. He considers that the available area is sufficiently large to warrant the undertaking of the joint scheme and that it is highly desirable to undertake the planting of dry padi experimentally before entering into a vast scheme for the production of rice. Mr. Hose favours the joint scheme and refers to the many benefits which could be derived therefrom.

Mr. Bell asks what area would be required for the Stock Farm to which Mr. Ellis replies 800 acres would be ample to start with.

Mr. Shelton-Agar enquires as to the allocation of the $100,000 vote to which it is replied that this money was voted solely for the Stock Farm. It is considered that separate estimates are required for each section but one general vote be asked for and accounts of which are to be kept separately.

Mr. Ferguson asks whether Gali is accessible. In reply it is mentioned by Mr. Ellis that Gali is accessible to Kuala Lipis by a good Government road and that it is not improbable that some day a branch line might connect Raub with the main line.

Mr. Shelton-Agar asks if any other suitable area is available near Kuala Lumpur and whether any endeavour has been made to procure a more accessible area.

Mr. Hose replies that it is a question of grass versus jungle and that no other suitable tract of grass land could be found. In reply to a question by Mr. Harvey, Mr. Ellis explains that the district is quite healthy.

After some discussion Mr. Ferguson thinks the scheme is an excellent one and proposes that the site at Gali be selected for the combined farm. This resolution is seconded by Mr. Shelton-Agar and unanimously agreed to.

Stock Breeding—Cattle.

Mr. Ellis outlines the general methods of improvement and refers to the local breed of live stock as being degenerate. He mentions that improvement of stock could be effected by distributing good sires throughout the country. It is considered advisable to commence by improving the breeds at the farm and afterwards distributing the improved sires throughout the country.

Methods of Improvement—

(1) By importing pure bred cattle from India and keeping a pure bred herd on the farm, preferably Nellore cattle. This breed is of the utmost value for beef, milk and draft purposes and is of special benefit in grading up other native breeds. They have the advantage of being practically immune from rinderpest and usually hand down that characteristic to their half bred calves.

(2) The importation of bulls of European breeds and crossing them with native or imported Indian cows. The advantages of this method are the improvement of the stock for milk and beef production. The half bred bullocks are very useful for draft purposes because of their increased size. Work in this direction has already been done in this country and an excellent half-bred herd is owned by a gentleman in Ipoh. Mr. HARVEY proposes and Mr. SHELTON-AGAR seconds that this fact be kept in mind with a view to purchasing a number of imported cows to start off the herd at Gali. This is agreed to.

It is proposed by the CHAIRMAN and unanimously agreed that bulls of European breeds be imported, preferably from Australia, and used to grade up the native stock.

Pigs:—On the motion of Mr. Ellis it is unanimously agreed to import Duroc-Jersey and Berkshire sows and boars to be used in grading up the breeds in this country.

Sheep.—Good sheep are bred in Kelantan and in parts of Pahang but could be improved by the importation of Indian stocks.

Poultry.—There is great room for improvement in poultry in this country and Mr. ELLIS proposes that pure bred poultry be imported. This is agreed to.

Mr. ELLIS informs the meeting that he hopes to go on leave at an early date and states that he is prepared to spend a large proportion of his leave in studying poultry breeding and management, dairy work, motor tractor work, and further, that he is prepared on his return journey to this country to spend some time in America, Philippine Islands and Hongkong in studying stock breeding generally and in visiting dry land padi areas in the Southern States. At the same time he points out that it is essential that an assistant with practical engineering experience and preferably with a knowledge of farm work be appointed from the commencement.

Mr. SHELTON-AGAR considers that Mr. Ellis should be given every opportunity of such study and supports the appointment of an assistant. These proposals are unanimously carried.

Mr. HOSE suggests that the Public Works Department be approached with a view to the construction of roads, drains and buildings now so that work could be gone on with during the absence of Mr. Ellis.

Mr. BRUCE suggests the employment of a planter to supervise the work of clearing the land, erecting fences and preliminary details. This resolution is seconded by Mr. FERGUSON and is agreed to unanimously.

The CHAIRMAN proposes that a sub-committee be appointed to consider the estimates of the scheme. The following gentlemen have agreed to serve: Mr. F. G. Harvey, Mr. J. Bruce and Mr. C. Bell.

Alum Coagulation.

The Chairman informs the meeting that action has been taken in accordance with what was agreed to at the last meeting. Mr. Eaton informed the Committee that in general the District Officers did not favour distribution of acetic acid through the Penghulus and were of opinion that the acid could be obtained from kedais in the districts.

The question of acetic acid distribution by small dealers is considered. It was suggested by Mr. Ferguson that the rubber dealers should stock acetic acid for sale to small holders and the Chairman agrees to enquire as to the possibility of carrying out this suggestion.

Seed Distribution.

The Chairman asks for the views of the members in respect of seed distribution by the Department of Agriculture. Mr. Shelton-Agar thinks that the Department might continue seed distribution for the present but is of opinion that planters should now endeavour to procure seed for themselves. It is agreed to inform the planting community accordingly.

Castor Oil.

The Chairman reads a letter from the Acting Secretary to Resident, Perak, regarding the production of local castor oil, also correspondence on the same subject.

Mr. Bruce thinks that there would be no difficulty as to procuring a market for the oil and machinery for its manufacture. As to the possibilities of the industry the committee think that this is a matter for experiment on the Government Plantation.

Para Rubber Seed.

Mr. Harvey asks if any action has been taken regarding the procuring of seed from Brazil. The Chairman replies that he was in communication with the Director, Royal Botanic Gardens, Kew, on the subject. He further states that if any action were taken, a properly organized expedition should be sent out and that this would not only consider seed selection but the study of the rubber tree there would receive attention.

Leaf Fall.

Mr. Shelton-Agar refers to a double leaf fall of the rubber tree in certain instances, and views the possibilities of damage to the tree with considerable alarm. The Chairman is of opinion that this is largely due to abnormal weather conditions. Mr. Harvey agrees with the Chairman but thinks that such leaf fall is generally accompanied by an attack of insects.

African Oil Palm.

The Chairman reads a letter from the Chief Secretary addressed to the British Residents on the desirability of reserving land in the Federated Malay States for the planting of African oil palm. The correspondence was referred to the Director of Agriculture for his views as to suitable land. It is considered that good land generally is suitable for its cultivation.

The meeting terminates at 1 p.m.

MINUTES OF ORDINARY MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA,

held at the Chamber of Commerce, Penang, on 27th October, 1919, at 10.30 a.m.

PRESENT:

The Honourable Mr. F. G. Harvey (*Chairman*)
Mr. J. W. Kennedy (*Vice-Chairman*)
„ C. Ward-Jackson (*Secretary*)

DELEGATES:

From the Bahau-Kuala Pilah D.P.A.		Messrs. C. W. Keppel-Powis and P. S. Castle
„	Batang Padang D.P.A. ...	„ C. B. Graburn and C. Darby
„	Batu Tiga D.P.A. ...	Mr. Carlyle Bell
„	Central Perak P.A. ...	„ N. B. Beach
„	Kajang D.P.A.	Messrs. H. L. Lamotte and T. G. Wiggins
„	Kapar „	Mr. W. J. S. Price
„	Kedah P.A.	Messrs. G. D. F. Sinclair and R. S. Chantler
„	Klang D.P.A.	Mr. R. Battiscombe
„	Kuala Lumpur D.P.A. ...	Messrs. J. Bloomfield Douglas, F. Clyde Jeavons and J. Grieve
„	Kuala Selangor „ ...	„ N. E. S. Gardner, Walter Towgood and Lt. Commander E. Perkins, R. N.
„	Lower Perak P.A. ...	„ Th. Dahl, W. H. Vaughan Smith, Wm. D. Tait and H. de H. Smith
„	Malay Pen. Agric. Assn....	„ H. Gough, F. D. Hindley, H. H. Wardlaw, M. Strivens and Geo. Stothard
„	Taiping D.P.A.	„ W. H. Tate and H. de Z. Lancaster
„	Ulu Selangor D.P.A. ...	Mr. L. W. Tivy

VISITORS.—Mr. E. W. F. Gilman (Ag. Controller of Labour), Mr. H. Lee-Warner (Agent to the Food Controller), Mr. D. A. M. Brown (Distributing Agent to the Food Controller) and Messrs. R. M. G. Mitchell (Johore), H. McGill (Penang), C. O. Tyndale Powell (Perak), J. G. Cruickshank (Perak), J. A. Clery and W. R. M. Vowler (Seremban)

1.—MINUTES.

On the motion of Mr. C. B. Graburn, seconded by Mr. H. de H. Smith, the minutes of the previous ordinary meeting are taken as read and are confirmed and signed.

2.—WAR RELIEF.

The SECRETARY submits the following statements of accounts of the Planters' War Relief Fund of Malaya:

PLANTERS' WAR RELIEF FUND OF MALAYA.

Statement of Accounts from April to October, 1919.

	$ c.		$ c.	$ c.
October, 1919—		By Stamps on Drafts ...	0 41	
To Collections ...	5,534 29	„ Remittance to London £500 at 2s. $4\frac{7}{32}d.$	4,252 49	
To Interest for half year	10 43			4,252 90
		„ Balance		1,291 82
	5,544 72			5,544 72

KUALA LUMPUR,
23rd October, 1919.

PLANTERS' WAR RELIEF FUND OF MALAYA.

Subscriptions received from April to October, 1919.

	$ c.	$ c.
BATANG PADANG D.P.A. ...	60.00	
		60.00
BATU TIGA D.P.A.		
Bennett, G. H. ...	25.00	
Begg, N. G.	25.00	
Chalmers, A. P. ...	15.00	
Gilman, M. A. P. ...	30.00	
McNeill, F.	30.00	
Orr, Douglas, H. ...	60.00	
Robertson, J. A. ...	10.00	
Webb, C. M. ...	5.00	
Williamson, J. ...	10.00	
		210.00
CENTRAL PAHANG P.A.		
Sungei Bilut Estate	10.00	
		10.00
CENTRAL PERAK P.A. ...	382.00	
Caldwell, W. J. ...	80.00	
Jonklaas, W. O. ...	20.00	
Robins, N.	5.00	
Wilson, T. K. ...	90.00	
		577.00
Carried forward		857.00

	$ c.	$ c.
Brought forward		857.00
JOHORE P.A. ...	60.00	
Segamat Estate ...	35.00	
Adamson, H. A. ...	30.00	
Bolton, G. V. ...	120.00	
Lanadron Estate ...	50.00	
Ross, D. A.	160.00	
Nordanal Estate ...	50.00	
		535.00
KAJANG D.P.A. ...	120.00	
Clerk, G. P.	20.00	
Cummins, E. N. T. ...	25.00	
Dakeyne, O. P. ...	50.00	
Ferrers, C. R. ...	120.00	
Kindersley, R. C. M.	50.00	
Mesney, R. F. ...	30.00	
Moullin, H. R. ...	75.00	
Paul, C. K.	40.00	
Schwabe, E. M. ...	40.00	
		570.00
KAPAR D.P.A.		
Pratt, J. C.	27.00	
Stonehewer, R. S. ...	17.00	
		44.00
Carried forward		2,006.00

	$ c.	$ c.
Brought forward		2,006.00
KELANTAN P.A.		
Anderson, W. G. ...	50.00	
Archer, L. D. ...	45.00	
		95.00
KLANG D.P.A. ...	17.86	
Biddlecombe, H. T. A.	36.00	
Greenhill, R. D. ...	50.00	
Gulland, D. L. ...	10.00	
Nepier Hendrie, R. ...	20.00	
Latimer, T. M. ...	20.00	
Maguire, C.	30.00	
Roberts, C. L. ...	30.00	
		213.86
KUALA LANGAT D.P.A.		
Irvine, D'Arcy, H. C.	30.00	
Lendrum, J. B. ...	45.00	
Mann, J. P.	30.00	
Munro, R. W. ...	60.00	
Symons, G. O. W. ...	40.00	
		205.00
KUALA LUMPUR D.P.A.		
Armstrong, H. ...	30.00	
Barnet, G. P. ...	150.00	
Campbell, F. M. ...	50.00	
Coppens, P.	20.00	
Douglas, J. B. ...	16.65	
Fox, A. J.	120.00	
Fraser, W. D. ...	40.00	
Harvey, T. R. ...	30.00	
Ladell, R. G. ...	20.00	
McCrow, D. W. ...	30.00	
Smith, Sharpe, M. ...	154.26	
		660.91
KUALA SELANGOR D.P.A.		
Gordon, W. M. ...	102.00	
Irving, L. A. ...	30.00	
E. D. M. K. K. ...	40.00	
		172.00
LOWER PERAK P.A.		
Bayley, H.	45.00	
Dell, W.	20.00	
Hargreaves, J. ...	40.00	
McLeod, R. A. ...	40.00	
Carried forward		3,352.77

	$ c.	$ c.
Brought forward		3,352.77
LOWER PERAK P.A.—(*cont.*)		
Pickering, J. T. ...	5.00	
Ratanui Estate Staff	59.77	
Symes, A. B. ...	45.00	
Tobutt, K. T. ...	10.00	
Wilson, R. J. ...	5.00	
		269.77
M. P. A. A.		
Bobe, E.	45.00	
Bukit Mertajam Estate	272.00	
Carless, H. G. ...	36.00	
Josselyn, E. W. ...	60.00	
Rubber Estates of Krian	79.00	
		492.00
NEGRI SEMBILAN P.A.		
Adair, H.	30.00	
Burgess, J.	20.00	
Clarkson, S. W. ...	10.00	
Fenton, R. D. ...	20.00	
Grant, G.	20.00	
Handover, W. P. ...	40.00	
Hay, J. B.	34.00	
Payment by H. K. B.	20.00	
Hearn, A. J.	30.00	
Kellit, W.	60.00	
King, H. W. F. ...	60.00	
Maycock, R. M. A. ...	40.00	
Paterson, A. F. ...	30.00	
Ritchie, C.	30.00	
Reynolds, K. P.	80.00	
Sepang Valley Estate	500.00	
Smith, E. E.	60.00	
Tayler, V. A. ...	50.00	
		1,134.00
TAIPING P. A. ...	130.00	
Moraes, H. F. ...	30.00	
Perera, C.	15.00	
		175.00
ULU SELANGOR D.P.A.		
Brunton, R.	20.00	
Coe, P. F.	60.00	
Kennedy, W. C. ...	30.75	
		110.75
Grand Total		5,534.29

Mr. HARVEY points out that the sum of $450 has been received since August last, and thinks that as subscriptions are still coming in the Fund should not be closed until the end of the Association's financial year.

3.—LABOUR.

(*a*) TAMIL IMMIGRATION.

The SECRETARY submits the following correspondence:

"12, MARKET STREET,
"KUALA LUMPUR,
"*4th September, 1919.*

"CIRCULAR LETTER TO ALL CONSTITUENT ASSOCIATIONS.

"DEAR SIR,

"I am directed to forward for your information the enclosed copy of a letter regarding the insufficiency of particulars given on kangani licences which was sent by Messrs. Binny & Co., Ltd., Madras, to the Deputy Controller of Labour, Penang.

"Please bring it to the notice of members of your Association.

"Believe me, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*"

"STRAITS EMIGRATION DEPARTMENT,
"BINNY & Co., LTD.,
"MADRAS,
"*31st July, 1919.*

"SIR,

"We have the honour to bring to your notice that the particulars of kanganies, such as height, marks, etc., are sometimes described incorrectly on licences issued by estates in the S. S. and F. M. S. We are inclined to think that those who make out these licences do not consider accuracy very important.

"We have, so far, managed to compete with these doubtful cases by questioning the holders as to their knowledge of the various details on the licences, but it would be much more satisfactory if the licences were made out more accurately.

"We have the honour, etc.,
"*for* BINNY & Co., LTD.,
"(Sd.) C. W. CHAMBERS,
"*Assistant Manager.*

"THE DEPUTY CONTROLLER OF LABOUR,
"PENANG."

"PENANG,
"*20th September, 1919.*

"SIR,

"I have the honour to forward herewith the latest revised list of taluqs which are at present closed to recruiting of Indian labourers in the Madras Presidency.

"(Sd.) H. STEVEN,
"*for Deputy Controller of Labour, Penang.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Recruiting has now been resumed in Madras Presidency except the following taluqs which are still closed owing to the prevalence of disease :

Wandewash, Cheyyur, Arkonum, Gudiyatham, Polur, Tiruvannamalai and Walajapet Taluqs	of North Arcot District
Punganoor and Tirupathi Taluqs	of Chittoor District
Tuni Taluq	of Godavari ,,
Ellore, Gudivada and Bhimavaram Taluqs	of Kistna ,,
Koilkeentala Taluq	of Kurnool ,,
Bimblipatam ,, ...	of Vizagapatam ,,
All Taluqs	of Malabar ,,
All Taluqs	of South Canara ,,
All Taluqs	of Ganjam ,,

Mr. HARVEY states that Mr. Gilman has been good enough to attend the meeting and that he will be glad to give information on any points raised by members.

Mr. WIGGINS proposes that on kangani licences photographs of the kanganies should be affixed, as this would obviate the necessity for passports. At present, descriptions of marks and other particulars about kanganies have to be entered upon licences and he thinks the inclusion of the actual photographs would render identification extremely easy.

Mr. HARVEY says the Controller of Labour has no objection to the suggested procedure so long as there would be no modification of the present rules. He expresses his own opinion that it is quite unnecessary to have kanganies' photographs upon these licences. He is not aware that there have ever been difficulties in identifying kanganies.

Mr. KENNEDY points out that the present system is working well and smoothly, and that if it were made compulsory to have photographs affixed to licences, considerable trouble to employers of labour would ensue.

Mr. JEAVONS thinks if managers took imprints of kanganies' thumb marks and if the licensees were properly described there should be no necessity for photographs.

Mr. WIGGINS formally proposes the resolution which is seconded by Mr. Lamotte, and is put to the meeting and declared not carried.

(*b*) DISCHARGE TICKETS.

Mr. CHANTLER explains that before the Kedah Planters' Association was affiliated to the Planters' Association of Malaya they approached the Government on the question of issuing discharge tickets; but the Government stated in reply that it was not prepared to make the issue of discharge tickets compulsory unless a similar system were adopted in the Federated Malay States. He thinks that a good many planters throughout the country are in favour of issuing discharge tickets, although he is aware that the Planters' Association of Malaya as a body has declared itself against it. He therefore proposes that the Government be approached with a view to making the granting of discharge tickets compulsory to all coolies leaving estates.

Mr. HARVEY asks whether Mr. Chantler is a delegate from the Kedah Planters' Association.

Mr. CHANTLER replies in the affirmative.

Mr. HARVEY refers Mr. Chantler to rule 9 which states, *inter alia*, that no Constituent Association shall have the right of voting unless the annual subscription shall have been paid. He announces that the Kedah Planters' Association have not paid their subscription. He does not wish to press the matter since the Kedah Planters' Association has just been formed and is now affiliated to the Planters' Association of Malaya; but he thinks it advisable, in order to protect himself, to call attention to the provisions of this rule.

He explains that the subject of discharge tickets was first brought up in 1908 and has been discussed almost every year since then until 1914 when the war apparently ousted the subject from its place on the Planters' Association of Malaya Agenda. On paper it may appear sound to introduce a system of discharge tickets in this country; but all the arguments which have been adduced for and against the system appear to show that it is not altogether advisable and that it would not be at all practicable. He thinks it would be prejudicial to our recruiting labour because the Madras Government, he is sure, would not consider the matter with much favour.

Mr. KENNEDY is entirely opposed to any system of discharge tickets in this country, and in view of the insufficiency of labour he thinks we should try our best to encourage labour to come here rather than hamper and discourage it as we should do if the system of discharge tickets were introduced.

Mr. HARVEY reads the following excerpt on the subject from the Report of the Seventh Annual Meeting of the Planters' Association of Malaya for the year ended 31st March, 1914:

"This subject has been one which has come up periodically ever since the early days of this Association. A sub-committee recommended their introduction as long ago as the middle of 1908; but the words then spoken by the Hon. Mr. John Turner that 'a system of

discharge tickets was emphatically not feasible, not perhaps on account of the attitude of our own, as rather of that which the Indian Government most likely would adopt '—still hold good. Mr. Turner spoke with an experience of twenty years in Demerara, where discharge tickets and indentured labour were in force, and even he was quite emphatic that with free labour discharge tickets were incompatible.

"Indeed it is clear that discharge tickets merely mean an attempt at re-introducing indentured labour—but it is equally clear that if the Government of India are still adopting a benevolent attitude towards our recruiting, this would quickly be changed if our labour ever became free in name only.

"And the same result would follow, if a successful system of penalizing local recruiting of labour by prohibitive registration fees was introduced. Again, if transfers of coolies from an estate popular with coolies to one undesirable were made without consulting the wishes of the coolies themselves; if employers put obstacles in the way of coolies giving notice to quit; in short, if any practices were resorted to, making the freedom of the cooly illusory: public opinion in India, already strongly suspicious of the position of their countrymen in this Peninsula, would without doubt compel the Government of India to close the door against us altogether.

"Those planters therefore who still clamour for discharge tickets, would do well to ponder the result of emigration to the Malay Peninsula from India being altogether prohibited.

"As a matter of fact, the system of discharge tickets is also a double edged sword to the employer; for once this system is introduced these tickets would become a marketable commodity, since identification of coolies is impracticable, and thus the latter position of the employer would become ever so much worse than his present, unsatisfactory though this may be.

"The rubber industry in this Peninsula has been built up on labour which is absolutely free—if so splendid a result has been possible, surely it will be equally possible for this industry to continue on the same basis."

Mr. TAIT seconds Mr. Chantler's proposal.

Mr. HARVEY says that although the Kedah Planters' Association has not paid its subscription it has sent in its assessment figures, and in the circumstances he rules the motion to be in order.

The motion is accordingly put to the meeting and is declared not carried.

(*c*) PENANG QUARANTINE.

The SECRETARY reports that the visitors appointed by the Planters' Association of Malaya were the Hon'ble Mr. F. G. Harvey (Chairman of the Planters' Association of Malaya); and Messrs. R. Hartley (Lower Perak Planters' Association); J. S. Ferguson (Central Perak Planters' Association); W. H. Tate (Taiping District Planters' Association); J. C. Osborne (Batang Padang District Planters' Association). He understands that in addition five members have been appointed by the Malay Peninsula Agricultural Association as visitors to the Penang Quarantine Station.

(*d*) Labour Clause in New Land Grants.

The Secretary submits the following correspondence:

"Kuala Lumpur,
"*3rd September, 1919.*

"Sir,

"Labour Clause in New Land Grants.

"I have the honour to inform you that at an ordinary meeting of this Association held on the 28th ulto. the following resolution was passed—viz: 'That before land is alienated for rubber planting, applicants should be required to satisfy the Government that they are in a position to recruit labour from outside the Federated Malay States.

"'Further that the Government might in cases where it is deemed advisable, insert special conditions in grants to insure the importation of labour, and that the Controller of Labour be instructed to satisfy himself that such conditions are being carried out.'

"A copy of this resolution has also been forwarded by me to the Controller of Labour, F.M.S.

"I have, etc.,
"(Sd.) C. Ward-Jackson,
"*Secretary.*

"The Under Secretary to Government,
"Federated Malay States,
"Kuala Lumpur."

"Kuala Lumpur,
"*September, 1919.*

"Subject.

"*Resolution regarding insertion of 'Labour Clause in New Land Grants.'*

"Sir,

"I have the honour to acknowledge the receipt of your letter dated the 3rd September, 1919, on the subject stated above.

"I have, etc.,
"(Sd.) C. C. Brown,
"*for Ag. Under Secretary to Government, F.M.S.*

"The Secretary,
"Planters' Association of Malaya,
"Kuala Lumpur."

"KUALA LUMPUR,

"*4th September, 1919.*

"No. 507/19.

"SIR,

"I have the honour to acknowledge the receipt of your letter of the 3rd instant conveying the resolution passed at an ordinary meeting of your Association held on the 28th August, 1919, on the subject of the desirability of a labour clause in new land grants.

"I have, etc.,

"(Sd.) B. F. BRIDGE,

"*for Ag. Controller of Labour, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

MR. HARVEY states there is no further correspondence on this subject.

(*e*) REGISTER OF TAMIL NAMES OF ESTATES.

The CHAIRMAN says that all District Planters' Associations have not yet forwarded the list of Tamil names of estates in their district and that as soon as these are to hand it is proposed to compile a register and have it printed and circulated to Constituent Associations

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4.—FOOD.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR,

"*3rd September, 1919.*

"RICE COMPENSATION.

"SIR,

"I have the honour to inform you that I am directed to forward to you a resolution which was passed at an Ordinary Meeting of this Association held on the 28th ulto., viz:

"'That this Association considers that planters and others who held stocks of rice on July the 1st should be compensated at the same rate as wholesale dealers and suggests that compensation be paid to planters at the same rate as to wholesale dealers.'

"A copy of this resolution has also been forwarded by me to the Agent to the Food Controller, Kuala Lumpur.

"I have, etc.,

"(Sd.) C. WARD-JACKSON,

"*Secretary.*

"THE DIRECTOR OF FOOD PRODUCTION,

"FEDERATED MALAY STATES,

"KUALA LUMPUR."

"KUALA LUMPUR,

"No. 3 in 327/19. "*9th September, 1919.*

"SIR,

"In reply to your letter of September 3rd on the subject of the compensation paid by the Government to dealers in rice on account of the loss which they incurred on sales of all stocks of rice held by them on July 3rd, 1919, by reason of the introduction of that date of fixed prices below the market rate then ruling, I am directed to inform you that the Food Controller regrets he is unable to approve the suggestion of your Association that similar compensation be paid to planters who held stocks of rice on the same date.

"2. I would point out, in this connection, that the Government is spending every month very large sums of money to bring rice to the consumer at a price far below the present market rate, and that thereby the planters, and other employers of labour in Malaya, financially and in every way, have benefited largely.

"I have, etc.,

"(Sd.) A. HUNTER,

"*Agent to Food Controller, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KUALA LUMPUR,

"SIR, "*16th September, 1919.*

"RETURNS OF STOCKS OF RICE AND PADI.

"With further reference to your letter dated July 31st, I have the honour to advise having despatched by the same post a parcel containing forms showing the return of stocks of rice and padi held by estates which are members of this Association, and a summary of these forms.

"2. I send enclosed herewith an account of the expenditure incurred by this Association in collecting the above information.

"I have, etc.,

"(Sd.) C. WARD-JACKSON,

"THE FOOD CONTROLLER, "*Secretary.*

"SINGAPORE."

"KUALA LUMPUR,

"SIR, "*2nd October, 1919.*

"RETURNS OF STOCKS OF RICE AND PADI.

"I have the honour to inform you that I have received no acknowledgment of my letter dated the 16th ulto., with enclosures.

"I have, etc.,

"(Sd.) C. WARD-JACKSON,

"THE FOOD CONTROLLER, "*Secretary.*"

"SINGAPORE."

"KUALA LUMPUR,
"*23rd September, 1919.*

"SIR,

"I have the honour to send enclosed for your information an excerpt from the minutes of the last meeting of this Association.

"I have, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*

"THE DIRECTOR OF FOOD PRODUCTION, F.M.S.
"KUALA LUMPUR."

"KUALA LUMPUR,
"*1st October, 1919.*

"No. 2 in 239/19.

"SIR,

"I have the honour to acknowledge the receipt of your letter of the 23rd ulto., forwarding for my information an excerpt from the minutes of the meeting of the Planters' Association of Malaya held on the 28th August, 1919.

"2. The subject of the supply of rice to labourers is one which concerns the Food Controller rather than the Director of Food Production, as the orders limiting the quantity of rice that may be supplied by employers to their labourers are issued by the Food Controller.

"3. I have shown your letter to the Food Controller, and the following remarks are made with his concurrence.

"4. Orders limiting the quantity of rice that may be supplied by employers to their labourers must necessarily be gazetted in order to give them the force of law.

"5. These orders must not be taken to imply any guarantee that any particular quantity of parboiled (or other) rice will be available, but I am authorized to say that the quantity of parboiled rice supplied to estates will be increased for the month of October to 80 per cent. of the quantity permitted to be supplied to labourers. It is always open to the labourers to make up the deficiency with other kinds of rice, locally grown foodstuffs, or with flour, bread, mee, mealie meal or other substitutes.

"I have, etc.,
"(Sd.) E. S. HOSE,
"*Director of Food Production, F.M.S. & S.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

LETTER TO ALL CONSTITUENT ASSOCIATIONS.

"KUALA LUMPUR,

"*23rd September, 1919.*

"FOODSTUFFS.

"DEAR SIR,

"With a view to helping the Director of Food Production, you are asked to be good enough to forward, through me, periodical reports relating to the nature and progress of foodstuff crops on the estates which are members of your Association.

"Believe me, etc.,

"(Sd.) C. WARD-JACKSON,

"*Secretary.*

The SECRETARY explains that at the last meeting of the Association he was instructed to write to the Director of Food Production to enquire whether he wanted particulars of food products planted on estates, and says he received the following reply from which it would appear that the Government has its own machinery for obtaining any information it may require. He further reports that only very few members of the Association have responded to his circular letter asking for this information.

"KUALA LUMPUR,

"No. 4 in 239/ 19. "*21st October, 1919.*

"SIR,

"I have the honour to acknowledge the receipt of your letter of the 18th instant, forwarding a copy of the minutes of a meeting of the Planters' Association of Malaya held on the 28th August, 1919.

"2. I have already obtained from District Officers detailed statements of the acreage cultivated with different kinds of foodstuffs on estates and mining lands, and District Officers have also been asked to report as to the approximate area under each crop that may be regarded as having failed.

"3. As was evidently realized at the meeting of your Association, accurate information on his latter point is very difficult to obtain, but steps are being taken to ascertain such facts as are available.

"4. At the same time I should much appreciate any information that owners and managers of estates would be willing to communicate to me direct or through their agents as to partial or total failures of food crops on the estates for which they are responsible.

"I have, etc.,

"(Sd.) E. S. HOSE,

"*Director of Food Production, F.M.S. and S.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

Mr. GRABURN says he has been asked to bring to the notice of this meeting the present position with regard to bonuses which the Government had promised to grant to planters who cultivated areas in excess of the Government requirements. He understands that returns of padi harvested should be made before the 31st of December of this year, and would ask whether estates which had planted a large acreage of padi, the crop of which would not be harvested until January or February, would be penalised by losing the bonus if returns were not sent in by 31st December. He thinks that the Association should ask Government if it would consider the cases of estates which had planted a large area under padi so that these may be eligible for the bonus even if the crop were harvested after December. He proposes the following resolution: "That the period for the Government bonus scheme for harvesting crops be extended for two months, i.e., until February 29th, 1920."

Mr. KENNEDY says the Malay Peninsula Agricultural Association has approached the Straits Settlements Government in this matter and had called attention to the same points as those raised by Mr. Graburn. The Straits Settlements Government refused to consider the matter of a bonus of $5 an acre, and pointed out that the Government was rewarding the Malay padi growers by guaranteeing the price of padi at 13 cents a gantang for a certain period.

Mr. JEAVONS agrees with Mr. Graburn and has pleasure in seconding the resolution. He urges the Association to take up this matter strongly as he does not see why planters who have cultivated large areas of padi should not be eligible for the bonus owing to the fact that the crop may not be harvested by December the 31st.

Mr. GRABURN'S resolution is put to the meeting and is carried *nem. con.*

Mr. HARVEY says that Mr. Lee-Warner, Agent to the Food Controller, has kindly come to the meeting, and reads the following letter which he has received from him:

"PENANG,
"*20th October, 1919.*

"No. 40 in A.F.C. 391/19.

"SIR,

"I am to-day in receipt of your letter of 18th instant reporting loss in transit of no less than 8 per cent. of your September parboiled supply.

"2. I have tried every expedient which has occurred to me or which has been suggested to me in this connection, and all without success.

"3. The Distributing Agency places full weight on board and has arranged with the Shipping Companies that they are to refuse any slack bags. So with the F.M.S.R.: any bag which is slack is refused (at *our* request) by the Railway people. Thus we have ensured full weight on truck or ship. The Shipping Companies rely on the clause in the B/L not to be responsible for loss on board and I presume that in so doing they are within their legal rights.

"You will thus see that, whether railing or shipping, we do all that is possible and all that can be demanded of us.

"4. That augmented thefts occur on rail and steamer I am only too well assured, but I am sure that you will agree with me that this is not within my province.

"5. If the control continues over next year, what do you think could be done by one of your big Associations in the matter, e.g., of chartering exclusively one boat or more per mensem OR so many special goods trains per mensem, delivering on rail or board to be made direct from my representative to a man appointed by your Association?

"6. I should be glad to discuss the matter with you and other planters in Kuala Lumpur say about mid-November, if you think we could effect anything of real utility thereby.

"I have, etc.,
"(Sd.) W. H. Lee-Warner,
"*Agent Food Controller, Penang.*

"F. G. Harvey, Esq.,
"The Petaling Rubber Estate,
"Selangor."

He thinks it is a matter of far more moment now to lose a gantang of rice than it was some time ago and is aware that rice thefts are increasing everywhere. He himself lost 8 per cent of the parboiled rice supplied to him in September, which meant that about fifty of his coolies had to go without a sufficient quantity of rice. Everything that could be done to prevent rice thefts should be tried, and if it were possible every District Planters' Association should arrange for special trucks in trains to convey their rice to stations nearest to them. He asks members to make any suggestions they may have for obviating thefts.

Mr. Lee-Warner thinks it may be possible next year to organize proper schemes to deliver rice to estates without loss in transit. He is sure that Mr. D. A. M. Brown, the Distributing Agent to the Food Controller, would be able to make the necessary arrangements with the railways and with the various Planters' Associations. He would suggest that each district should have a separate date on which to receive rice. It could be sent to different centres at different dates during each month if planters could make the necessary arrangements on their side for receiving it. He thinks that 10 days would be sufficient for the procedure he has outlined.

Mr. Harvey thinks this important matter should be discussed by all Constituent Associations and that some arrangements might be decided upon in order to carry out the scheme outlined by Mr. Lee-Warner. If planters could arrange to receive their rice there would be satisfactory despatch by the Distributing Agent. The time might soon come, he thinks, when it will be possible to have rice sent by parcel post.

Mr. LEE-WARNER instances the case of a certain shipment of rice to Kuala Selangor in which there was a shortage of about 14 per cent. and has no doubt that the shortage was due to sampling during transit. He points out that there should be only one representative at Port Swettenham to take deliveries instead of several, as in this matter there is not safety in numbers.

Mr. TOWGOOD asks whether it is possible to send rice to Kuala Selangor by rail.

Mr. LEE-WARNER replies in the affirmative.

Mr. LAMOTTE reports that he has his supply of rice sent to Kajang by rail and that he finds very little loss.

Mr. LEE-WARNER is glad to hear Mr. Lamotte's testimony.

Mr. HARVEY thinks that this is clearly a matter for District Planters' Associations to consider with reference to the scheme for despatching supplies of rice to certain stations in sealed trucks. He thanks Mr. Lee-Warner and Mr. Brown on behalf of the Planters' Association of Malaya for attending the meeting and for giving so much useful information and valuable suggestions.

5.—RAILWAY MATTERS.

The SECRETARY submits the following correspondence:

"KUALA LUMPUR,
"*3rd September, 1919.*

"SIR,

"I have the honour to request the favour of a reply to my letter dated July 1st, which was sent in acknowledgment of your letter No. 3209 under date 30th May last.

"I have, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*

"THE UNDER SECRETARY TO GOVERNMENT,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*23rd September, 1919.*

"SIR,

"I have the honour to inform you that I am still without reply to my letter dated July 1st, which was sent in acknowledgment of your letter No. 3209 under date May 30th last, and to my reminder of the 3rd instant.

"I have, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*

"THE UNDER SECRETARY TO GOVERNMENT,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*2nd October, 1919.*

"No. C.S.O. 3209/19.

"SIR,

"I am directed to acknowledge receipt of your letter dated the 23rd September, 1919, on the subject of Railway passenger service on Sundays.

"Your letter of the 1st July, 1919, was duly received and the expression of opinion noted.

"When a definite decision on the subject has been arrived at, due notice will be given to the public.

"I have, etc.,
"(Sd.) C. A. VLIELAND,
"*for Acting Under Secretary, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*23rd September, 1919.*

"No. G.M.R. 3820/17.

"SIR,

"With reference to previous correspondence on the subject of additional constables at certain stations in connection with storage of rubber at night, I have the honour to inform you that the following stations have now been supplied with two Railway Police constables each:

1.	Kreh	7.	Bidor
2.	Sungei Patani	8.	Ulu Yam
3.	Sungei Bakap	9.	Jeram
4.	P. Tanjong	10.	Assam Java
5.	P. Rengas	11.	Kuala Pilah
6.	Salak North	12.	Teluk Piai

"Other stations will be dealt with when we have sufficient recruits.

"I have, etc.,
"(Sd.) F. H. ENGLISH,
"*for General Manager, F.M.S.R.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*24th September, 1919.*

"SIR,

"I have the honour to acknowledge your letter No. G.M.R. 3820/17 of yesterday's date and to thank you for the arrangements made in respect of the 12 stations enumerated.

"I have, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*

"THE GENERAL MANAGER,
"F.M.S. RAILWAYS,
"KUALA LUMPUR."

Mr. HARVEY calls attention to the correspondence on these matters which shows that no decision has yet been arrived at with regard to passenger service on Sundays; but thinks as the Federated Malay States Railways is about to receive a considerable number of locomotives the question of increased services would be attended to.

With regard to delivery of produce of estates at railway godowns, he says that the number of stations which could accept rubber had been increased by 12, which is very satisfactory.

6.—SMALL CHANGE.

The following correspondence is submitted by the Secretary:

"KUALA LUMPUR,
"*3rd September, 1919.*

"DEAR SIR,

"I shall be obliged if you will inform me whether there is any foundation for a statement which was made at an ordinary meeting of this Association held on the 28th ulto., to the effect that the local Banks refuse to accept 10-cent notes.

"Believe me, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*

"THE AGENT,
"CHARTERED BANK OF INDIA,
"AUSTRALIA AND CHINA.
"MERCANTILE BANK OF INDIA, LTD.,
"HONGKONG AND SHANGHAI
"BANKING CORPORATION,
"KUALA LUMPUR."

"KUALA LUMPUR.

"*4th September, 1919.*

"DEAR SIR,

"In reply to your letter of yesterday's date the statement 'that the local Banks refuse to accept 10-cent notes' is entirely incorrect.

"The Banks are of course under no obligation to handle 10-cent notes for persons other than their own customers although this is frequently done.

"I am, etc.,

"(Sd.) C. A. PEARCY,

"*for Agent,*

"*Chartered Bank of India,*

"*Australia and China.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KUALA LUMPUR.

"*4th September, 1919.*

"DEAR SIR,

"In reply to your letter of 3rd instant the statement to which you refer is, no doubt, founded on the fact that the Banks have refused to accept forgeries and mutilated 10-cent notes, of which there are a considerable number in circulation.

"We would also point out that these notes are legal tender only to the extent of $2.

"Yours faithfully,

"(Sd.) JOHN S. FERRIER,

"*Agent, Mercantile Bank of India, Ltd.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KUALA LUMPUR,

"*4th September, 1919.*

"DEAR SIR,

"In reply to your letter of 3rd instant we are not aware of having at any time refused to accept 10-cent notes, but we would add that such notes are legal tender up to only a small sum and no doubt Banks would not care to receive them in large amounts or from other than their own constituents.

"Yours faithfully,

"(Sd.) G. G. S. FORSYTH,

"*Agent.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"KUALA LUMPUR,
"*23rd September, 1919.*

"SIR,

"With further reference to your letter No. 4007/19, dated 5th July, and to the Chief Secretary's promise contained therein, I have the honour to inform you that I am directed to enquire when the shortage of subsidiary coins is likely to cease.

"I have, etc.,
"(Sd.) C. WARD-JACKSON,
"*Secretary.*

"THE UNDER SECRETARY TO GOVERNMENT,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*4th October, 1919.*

"No. C. S. O. 4007/19.

"SIR,

"In reply to your letter dated 23rd September, asking when the shortage of subsidiary coins is likely to cease, I am directed to inform you that a certain amount of small silver has already been issued, and it is anticipated that the shortage will cease to exist in the near future.

"I have, etc.,
"(Sd.) T. S. ADAMS,
"*for Ag. Under Secretary, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Mr. HARVEY says it is daily becoming more apparent that a considerable amount of subsidiary coins is now in circulation. According to a statement made by the Officer Administering the Government at a Legislative Council Meeting held recently, the question of currency and paper money was receiving due and proper attention. He has no doubt that before long the last will be seen of the disreputable 10-cent notes.

7.—THE MALAYA ASSOCIATION.

"KUALA LUMPUR,
"*29th August, 1919.*

"DEAR SIR,

"I thank you for your letter dated July 1st, and in reply have pleasure in sending enclosed, for the information of your Association, a copy of the rules of this Association as adopted at the meeting held on July 31st.

"If you will refer to No. 4 thereof, you will observe that the Association consists of a President, a Vice-President and not more than 28 other members.

"Believe me, etc.,
"(Sd.) C. WARD-JACKSON,
"*Hon. Secretary,*
"*The Malaya Association.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

8.—LICENSING OF COPRA DEALERS.

Mr. HARVEY reads the following resolution forwarded by the Lower Perak Planters' Association asking the Government for the introduction of legislation regarding the licensing of copra dealers.

> "That this Association ask the Government to assist coconut planters by introducing legislation to enforce the licensing of copra dealers."

Mr. H. DE H. SMITH explains that the resolution was placed on the agenda by the request of his Association and that their reason for doing so was that the epidemic of copra thefts in his district was increasing and becoming a very serious matter. Copra was stolen in large quantities from estates, and also from tongkangs and godowns while awaiting shipment. The quantities stolen were not small; in cases of large shipments 10 to 12 per cent. was lost through theft alone. A few convictions have been obtained but these had produced no deterrent effects thus far. At present anybody is able to deal in copra. The matter was thoroughly enquired into by the District Officer with much care and attention, and he had attended the meeting of the Lower Perak District Planters' Association when this question was discussed, and before the meeting had made a tour round the native holdings, which comprised a large area, in order to find the views of the leading Malays who had also complained of thefts and who thought that copra dealers should be licensed. The licensing of rubber dealers was responsible for several convictions, and it had also greatly reduced thefts of rubber. He thinks that similar legislation should be introduced to apply to copra dealers. The area under coconuts in the Lower Perak district alone was, approximately, 70,000 acres which represents a large acreage and justifies the Federated Malay States Government in introducing the legislation asked for. He adds that the thefts complained of commenced when the price of copra went up to $19 or $20 per pikul, and hopes that all rubber planters will support coconut planters in this very vital matter.

Mr. VAUGHAN SMITH gives some interesting figures regarding copra which passed through the Customs Office at Bagan Datoh from May to August together with the percentages of loss in shipments to Singapore and Penang. He further states that frequently bags of copra arrive at ports ripped open and with large quantity missing.

Mr. HINDLEY supports the resolution on behalf of the coconut planters in Province Wellesley, and asks the Association to apply for legislation to be made operative in the Straits Settlements as well as in the Federated Malay States. Thefts were occurring throughout the Province.

Mr. KENNEDY also supports the resolution and states that copra is a very valuable commodity, and thinks coconut planters should be given every support in their attempt to protect this industry.

Mr. HARVEY asks Mr. Smith whether he will agree to amend the resolution as suggested by Mr. Hindley, and he considers it would be well to state in the resolution that the legislation should be on the same lines as that applied to rubber dealers.

Mr. SMITH agrees to both these amendments.

Mr. HARVEY reads the resolution as amended: "That this Association ask the Government to assist coconut planters by introducing legislation to enforce the licensing of copra dealers in the Federated Malay States and Straits Settlements on the same lines as the rubber dealers."

Mr. VAUGHAN SMITH seconds the proposal which is carried unanimously.

9.—NIGHT TELEPHONES.

Mr. LAMOTTE says he has been instructed by his Association to bring up again the question of night telephones for the Kajang district. When they applied for it during the war they were informed that materials could not be obtained; but now they were told they could not have it unless there were 100 subscribers in the Kajang district. Further, they were informed that the cost of engaging night operators would be $1,080 a year. He points out that subscriptions from the Kajang district for telephones amount to $12,000 a year, and he does not therefore think that the Government should make this question a matter of money. If residents at Kajang want a doctor they have to come to Kuala Lumpur by car. His Association therefore propose that a deputation of the District Associations affected meet the Chief Secretary to ascertain the prospect of obtaining a night telephone service.

The CHAIRMAN thinks this is hardly a subject the Planters' Association of Malaya could take up since it appeared to be a matter purely for Kajang and the other Associations similarly affected.

Mr. JEAVONS believes the question of night telephones has been brought up before the Kuala Selangor and other Associations who were very keen on getting night telephone services; but he agrees that the resolution as it stands should not go forward, as it appeared to affect only one District Planters' Association.

Mr. HARVEY points out that the resolution refers to all District Associations affected and that it cannot go forward in its present form.

Mr. JEAVONS suggests that the resolution be amended to meet the case.

Major Gough thinks the Planters' Association of Malaya should send a deputation on behalf of those District Planters' Associations which are interested in the subject.

Mr. Lamotte therefore moves the following resolution: "That the Resident be requested to receive a deputation of members of the Planters' Association of Malaya with regard to night telephone services in outlying districts."

The Chairman says it is understood that the deputation should consist of representatives from the District Planters' Associations affected.

Mr. Wiggins seconds the resolution which is carried *nem. con.*

10.—DISTRICT NURSES.

Mr. Tivy informs the meeting that his Association, in view of the shortage of nurses, suggests the formation of District Nursing Associations. In his district, the number of married planters with families is rapidly increasing and there is a great necessity for establishing a Central Nursing Association in Malaya.

Mr. Keppel-Powis gives details of the case of a European lady who was admitted to the Seremban Hospital where there is no female ward.

Mr. Harvey asks whether Mr. Keppel-Powis is speaking on the subject of district nurses.

Mr. Keppel-Powis merely wishes to mention this matter but agrees that it is besides the subject before the meeting.

Mr. Tivy thinks that the Standing Committee should go into the matter with a view to formulating a scheme for organizing Nursing Associations.

Mr. Harvey thinks it a tall order to expect the Standing Committee to do this immediately, and suggests that the Ulu Selangor District Planters' Association should first put forward some details of their requirements in this matter.

The Secretary reports that he has been in communication with the Honorary Secretary of the Perak Nursing Association who states his Association would be quite willing to extend its operations if guarantees of sufficient financial support were forthcoming.

Mr. Jeavons asks whether some Perak gentlemen will inform the meeting how the Perak Nursing Association is run.

Mr. H. de H. Smith replies that several estates subscribe towards this Association and when the services of nurses were required these could always be obtained although at the present moment they were short staffed.

Mr. Harvey proposes that the matter be referred to the Ulu Selangor District Planters' Association for a definite scheme to be put before the Standing Committee.

This is agreed to.

11.—RECONSTITUTION OF THE PLANTERS' ASSOCIATION OF MALAYA.

Mr. HARVEY mentions that at the last ordinary meeting of the Association the question of reconstituting the Planters' Association of Malaya was brought up and it was decided that the matter be referred to the Standing Committee. The Standing Committee duly met and spent the greater part of one Sunday discussing the subject, with the result that a memorandum with suggestions for re-organizing the work of the Association, which was prepared by Mr. J. W. Kennedy and amended by the Standing Committee, is now available.

The SECRETARY reads Mr. Kennedy's scheme.

"1. Membership shall consist as at present by District Planters' Association being affiliated to the Planters' Association of Malaya on the present basis of subscription, or, similar basis.

"2. The business of the Association shall be transacted by a Council which shall consist of the following representatives: Perak, Province Wellesley and Dindings 6, Selangor 4, Negri Sembilan 4, Johore 2, Kelantan 1, Kedah 1, Pahang 1, making 19 members of Council, to whom would be given powers to co-opt additional members of Council provided always that the total number of members of Council shall not exceed 30.

"3. The Chairman and Vice-Chairman of the Association shall be Chairman and Vice-Chairman respectively of the Council and be elected from among members of Council by the members of the Association at the annual general meeting.

"4. The Council would be elected as follows:

(*a*) Each District Planters' Association would receive from the Secretary at a specified date before the annual general meeting nomination papers, the number of which would correspond with the number of votes to which each District Planters' Association was entitled.

(*b*) Each District Planters' Association would then fill in its nomination papers and would be confined to nominating members of Council from its own particular State. The gentlemen showing the greatest number of nominations would be elected to the Council and the result declared at the annual general meeting.

"5. The Council would meet quarterly, or, as and when required, at centres to be decided by the Council.

"6. Committees would be appointed by the Council who would deal with important matters, as say, Labour; Immigration; Medical matters; and Scientific Research; but recommendations or decisions made by such committees would have to be ratified or confirmed by the Council.

"7. District Planters' Associations desirous of having matters dealt with by the Council could send in their requests; and in the event of its being deemed expedient, the Council may invite a District Planters' Association to send a representative to attend a meeting or meetings of the Council to confer with the Council in connection with the business to be considered.

"8. Two general meetings would be held each year:

(*a*) The annual general meeting to receive a report of the Council's work; accounts for the year; to elect a Chairman and Vice-Chairman and to declare elected a Council for the ensuing year.

(*b*). A half-yearly meeting to receive the Council's report of work done during the preceding six months, and to afford members of the Association an opportunity of asking questions with regard to the work done, or, to criticize the work of the Council."

Mr. KENNEDY says he had hoped that Mr. Harvey, as Chairman, would undertake the task of explaining why the Standing Committee thought it advisable to submit a scheme for re-organizing the work of the Planters' Association of Malaya; but perhaps as one of the prime movers in the matter a few words from him may not be amiss. He has felt for some time that the work of the Planters' Association of Malaya could be carried out more efficiently, more expeditiously, and with a smaller expenditure if the work were entrusted to a smaller body invested with the necessary powers to transact the business of the Association.

At the present time ordinary meetings of delegates are held every second month, irrespective of whether there is important business to transact or not, and the District Planters' Associations sometimes incur expenditure in sending delegates considerable distances to attend those meetings, and the results are very often neither commensurate with the expenditure involved nor the loss of time to delegates. Another point is, that with large unwieldy meetings of delegates, side issues crop up in discussions and much time is wasted discussing points of minor interest to the Association as a whole. Yet another point is, that District Planters' Associations are rather prone to delegate to the Planters' Association of Malaya problems that mainly concern themselves locally, with the result that a large number of the delegates attending an ordinary meeting are wholly ignorant of the questions sometimes under discussion and are therefore not qualified to come to any decision or vote on such matters.

It seems to him that every District Planters' Association should endeavour to thrash out and deal with its own local problems and that it should exhaust every means in its power to attain its objects before it has recourse to the Planters' Association of Malaya. The Planters' Association of Malaya should, in his opinion, deal only, as far as possible, with the bigger questions affecting the agricultural industries of Malaya as a whole.

Then there is the question of the Standing Committee. At present this Committee is frequently called upon to consider questions of great importance to the Association. Some members of Committee have to travel considerable distances to attend meetings with loss of time and money, and after spending considerable time in discussing questions and making recommendations thereon, such recommendations having to be referred back to an ordinary meeting of delegates, there is no guarantee that their recommendations may not be turned down in the ordinary meeting of delegates, thereby the time and labour of the Standing Committee are wasted, as that committee, as at present constituted, has no powers whatever.

He submits that the scheme which has been laid before the meeting to-day would obviate the drawback he refers to. He also submits that the advantages from the scheme would be that a limited body of members representing each State would concentrate their attention mainly on the bigger and more important questions affecting agriculture in the Peninsula generally, much useless discussion would be eliminated, the work would be carried out with greater expedition, and less expenditure would be involved in the work of the Association. Under the changed conditions now prevailing reconstruction appears to be the order of the day the world over, therefore, if we as a body of planters representing the agricultural industries in Malaya can advance the interests of those industries by reconstructing the work of this Association then let us do so, and if a better scheme of reconstruction can be put forward than that submitted by the Standing Committee to-day he will gladly give it his support.

Mr. GRABURN thinks Mr. Kennedy is to be congratulated upon the scheme he has put before the meeting, and has only one suggestion to make regarding it which is, that delegates from Constituent Associations should form State Committees, and that delegates from these Committees should go to the Planters' Association of Malaya Council. Questions could be discussed by State Committees before being submitted to the Planters' Association of Malaya and fuller information could be obtained. Thus a good deal of time could be saved and trifling matters would not be sent up to the Planters' Association of Malaya for discussion. If such Committees could be formed, he thinks it would be to the advantage of the rubber industry and to the Association.

Mr. HARVEY says that under rule 28 it is impossible to come to a decision at this meeting even if they wish to do so, since any alterations of or additions to the rules of the Association must be decided at the annual general meeting or at a special general meeting convened for the purpose.

He refers to Mr. Kennedy's scheme which has been amended by the Standing Committee and also mentions the outline of Mr. Graburn's scheme for establishing State Committees. He says he himself has drawn up a scheme which is somewhat different from Mr. Kennedy's and which goes much further. It is a scheme for incorporating the Planters' Association of Malaya in much the same way as two of the largest planting associations in the East, namely, the Planters' Association of Ceylon and the United Planters' Association of Southern India. The draft of the scheme in question is too long to read here but he wishes to circulate it among all members so that the various proposals for reconstituting the Association could be discussed by District Planters' Associations who can arrive at some decision upon this important matter. He thinks that re-construction is very necessary and that it will mark a great step forward in the work of the Planters' Association of Malaya. He explains that the scheme is being put forward by himself as an individual and not as Chairman or as a member of the Standing Committee. He suggests that the two schemes be printed and circulated among District Planters' Associations.

This suggestion was adopted *nem con.*

12.—Mr. H. C. E. ZACHARIAS.

The Secretary submits the following letter from Mr. Zacharias:

"Kuala Lumpur,

"*25th August, 1919.*

"Dear Sir,

"I have the pleasure to acknowledge receipt of your letter of the 23rd inst. and cheque for $1,780.50 enclosed.

"May I ask you to accept my warmest thanks for the extremely generous way in which the planters have treated me in the matter of my retirement. I need not say how much I feel the kindness which has prompted all this and how greatly I appreciate the purse subscribed not merely for the financial assistance but as a proof that I have been able to win their whole-hearted approval of the services which I have so gladly rendered to the Planting Community all the years I have been resident in this Peninsula.

"Their goodwill and confidence is indeed a very pleasant and precious memory for me to take away from here after 15 long years, and I would ask you to accept on your own behalf and to convey to all the subscribers my heartfelt thanks for the great consideration and personal kindness I have ever received at the hands of my planting friends in this country.

"With my most sincere wishes for your and their future welfare.

"Believe me,

"Very gratefully yours,

"(Sd.) H. C. E. Zacharias.

"F. G. Harvey, Esq.,

"Chairman,

"Planters' Association of Malaya,

"Petaling."

Mr. Harvey announces he has received further subscriptions towards the purse presented to Mr. Zacharias and that the total amount just exceeds the sum of $2,000.

13.—AGENDA.

Mr. H. de H. Smith states that agenda of Planters' Association of Malaya meetings seldom reach them earlier than seven or eight days before meetings, and calls attention to the rule requiring that 14 days notice shall be given of ordinary meetings. He complains that they are not able to give members the requisite notice in order to enable them to meet and discuss matters and instruct their delegates. He would also mention that fuller information should be given of subjects placed on agenda. Very often it was impossible to know in what connection matters were brought up, and consequently members of District Planters' Associations were unable to come to any decision.

Mr. HARVEY promises that the matter will receive his attention; but points out it is difficult to issue agenda sooner since it must be kept open until 14 days prior to meetings so that subjects may be included therein. He mentions it frequently occurs that after the draft has been drawn up and the final proof sent in, District Planters' Associations forward resolutions at the last moment which, of course, have to be included. He states the new Secretary has done his utmost in the matter. As to the other point raised by Mr. Smith, that no information is sent along with subjects, it is impossible to give details in agenda. For instance, on the question of district nurses no information whatever was supplied by the Ulu Selangor District Planters' Association but only a bare request that the subject be placed on the agenda.

The SECRETARY states that in respect of the two agenda for which he has been responsible, copies have been despatched from the Planters' Association of Malaya office on the 14th day preceding the date of the meetings. Further he is ready and willing always to embody in agenda any details or information that constituent bodies may care to forward explanatory of a subject or resolution to be placed upon agenda. He says Mr. Tivy asked him over the telephone at the last moment to include the subject of district nurses in the agenda of this meeting.

Mr. H. DE H. SMITH suggests that the Hon. Secretaries of District Planters' Associations should be asked to supply the Secretary with full information on subjects which are to placed upon the agenda at their request.

The SECRETARY promises to attend to this matter.

14.—NEXT MEETING.

It is decided to hold the next meeting of the Association in Kuala Lumpur towards the end of December.

With a vote of thanks to the Chair, the meeting terminates at 12.15 p.m.

C. WARD-JACKSON,
Secretary.

Rubber statistics for 1918 from holdings less than 100 acres in extent.

Districts.	Acreage planted.	Acreage in bearing.	Number of trees tapped.
Perak—			
Krian	11,341	3,795	* 569,250
Larut	19,374	9,133	* 1,369,950
Kuala Kangsar	36,954	17,141	* 2,571,150
Upper Perak	6,723	1,689	* 253,350
Kinta	21,180	10,605	* 1,590,750
Batang Padang	19,587	* 8,669	1,300,368
Lower Perak	19,542	* 9,929	1,489,459
Total ...	134,701	60,961	9,144,277
Selangor—			
Kuala Lumpur	10,000	† 7,925	* 1,188,750
Klang	11,833	6,072	‡ 1,214,400
Kuala Langat	13,400	4,200	* 630,000
Kuala Selangor	6,096	2,212	* 331,800
Ulu Langat	39,134	31,400	4,710,000
Ulu Selangor	21,330	6,238	* 935,700
Total ...	101,793	58,047	9,010,650

* Calculated at the rate of 150 trees to an acre. † Taken from the return for 1917. ‡ Calculated at the rate of 200 trees to an acre.

Rubber statistics for 1918 from holdings less than 100 acres in extent.

Districts.	Acreage planted.	Acreage in bearing.	Number of trees tapped.
Negri Sembilan—			
Seremban	15,510	10,311	* 1,546,650
Kuala Pilah	12,300	5,580	* 837,000
Tampin	9,665	3,592	* 538,800
Port Dickson	16,502	1,089	* 163,350
Jelebu	1,468	767	* 115,050
Total ...	55,445	21,339	3,200,850
Pahang—			
Lipis	3,300	740	* 111,000
Raub	5,500	4,300	* 645,000
Kuantan	12,000	1,500	* 225,000
Pekan	548	† 90	* 13,500
Temerloh	1,810	1,110	166,500
Total ...	23,158	7,740	1,161,000

* Calculated at the rate of 150 trees to an acre. † Taken from the return for 1917.

Total.

——	Perak.	Selangor.	Negri Sembilan.	Pahang.	Total.
Acreage planted ...	134,701	101,793	55,445	23,158	315,097
,, in bearing	60,961	58,047	21,339	7,740	148,087

Abstract of Meteorological Readings in the various Districts of Malaya for the month of August, 1919.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	144.0	84.0	93.22	74.03	19.19	76.9	.790	72.2	67.	...	6.88	2.65
Pahang, Kuala Lipis	...	...	82.97	91.13	74.74	16.39	77.09	...	...	...	...	2.99	1.03
Johore, Johore Bahru	...	...	...	87.98	74.10	...	...	...	...	...	...	5.32	1.38
Singapore, Kandang Kerbau ...	29.814	142.5	84.4	88.6	75.8	12.8	78.8	.902	...	77.	S.E.	5.17	2.40
Malacca, Durian Daun ...	29.849	146.0	82.0	88.0	74.0	14.0	78.0	.920	...	81.	S.W.	5.66	.94
Negri Sembilan, Seremban ...	...	156.7	81.6	88.6	71.8	16.8	77.7	.874	75.2	80.6	N.E.	1.42	1.41
,, Kuala Pilah ...	...	150.1	81.4	91.7	...	...	79.4	.768	70.2	69.7	...	2.62	.51
,, Port Dickson...	...	117.2	82.5	89.0	74.3	14.7	77.7	.835	74.5	77.2	...	11.06	3.81
Selangor, Kuala Lumpur ...	29.804	151.1	83.0	91.0	72.2	18.8	77.3	.831	73.7	74.0	Calm.	4.22	1.65
,, Klang	...	...	81.8	86.0	75.2	10.8	76.8	...	...	...	...	5.77	1.89
,, Kuala Selangor ...	...	...	...	90.0	75.4	14.6	...	...	...	...	...	3.16	1.12
,, Rawang	...	...	...	92.6	...	...	...	...	...	...	...	.82	.25
Perak, Telok Anson	...	...	83.63	95.0	72.0	23.0	78.63	.849	...	78.	...	3.54	1.41
,, Ipoh	...	...	83.19	95.0	71.0	24.0	76.88	.839	74.11	75.	...	2.79	1.18
,, Taiping	...	112.0	83.26	94.0	69.0	25.0	78.61	.916	...	81.	...	5.43	2.31
,, The Cottage	...	...	...	...	...	...	...	...	...	...	...	9.99	3.66
,, Parit Buntar	...	...	82.17	93.0	71.0	22.0	76.97	.856	...	78.	...	7.24	3.50
Penang, George Town	29.802	146.0	82.3	91.2	71.2	20.0	78.2	.917	69.2	80.5	N.W.	5.27	1.25
Kedah, Alor Star	...	...	...	...	...	...	...	...	...	...	...	3.01	1.03
Perlis, Kangar	...	...	...	90.19	75.35	14.84	...	...	...	...	...	2.96	.86